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# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**AVIATION PROOF OF CONCEPT:  
THE TRANSITION OF MARINE CORPS AVIATION  
MAINTENANCE COMPUTER ASSETS AND SYSTEMS INTO  
THE NAVY MARINE CORPS INTRANET**

by

Gerald R. Hightower

March 2010

Thesis Advisor:  
Second Reader:

Glenn Cook  
Carl Oros

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**AVIATION PROOF OF CONCEPT:  
THE TRANSITION OF MARINE CORPS AVIATION MAINTENANCE  
COMPUTER ASSETS AND SYSTEMS INTO THE NAVY AND MARINE CORPS  
INTRANET**

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Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT**

from the

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## **ABSTRACT**

The Navy Marine Corps Intranet began planning to transition Marine Corps aviation computer assets to the NMCI network in 2004. Despite the preceding years of transferring other Navy and Marine Corps IT assets, NMCI offered no assurances that the transfer of Marine Corps aviation maintenance computers and systems would transition to NMCI without service interruption. Marine Corps aviation units use the Naval Tactical Combat Support System (NTCSS) every day in garrison and while deployed to document and track maintenance actions; it is the mandatory element necessary to enable Marine Corps aviation units to maintain aircraft operational readiness.

The Marine Requirements Oversight Council concluded that a proof of concept would be conducted to ensure NMCI computers would meet the requirements for Marine Corps deploying units. Contract line item number 0004AC (CLIN 4AC) was selected as the most effective and affordable CLIN from the NMCI products. Marine aviation was chosen as the test element since IT connectivity in garrison and while deployed is crucial to maintain aircraft readiness.

This thesis followed the Aviation Proof of Concept (APOC) from its requirements phase to final implementation. It started with developmental testing to identify issues in relation to transitioning the Marine Corps aviation NTCSS network into NMCI. The issues discovered during the development test were brought forward for the APOC's Test Integration Working Group (TIWG) to analyze and mitigate. The APOC's operational test used actual Marine aviation units to operate NMCI deployable computers in a real-world environment. The thesis concludes with the current APOC status and future research.



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## **LIST OF ACRONYMS AND ABBREVIATIONS**

AIMD	Aircraft Intermittent Maintenance Department
APOC	Aviation Proof of Concept
AOR	Assumption of Responsibility
ATC	Authority To Connect
ATO	Authority To Operate
BIO	Basic Input Output
BIOS	Basic Input Output Services
CDR	Central Data Repository
CLIN	Contract Line Item Number
CONUS	Continental United States
DAA	Designated Approving Authority
DADMS	Defense Automated Document Management System
DC AVN	Deputy Commandant Aviation
DM	Decision Meeting
DNMCI	Director Navy Marine Corps Intranet
DON	Department of the Navy
DoD	Department of Defense
DRPM-NMCI	Direct Reporting Program Manager NMCI
DT	Developmental Test
DTSB	Deployable Site Transport Boundary
DWG	Deployables Working Group
EDS	Electronic Data Systems
eMp	eMarketplace
GB	Gigabit
HQMC	Headquarters Marine Corps
HMH	Helicopter Marine Heavy
IP	Internet Protocol
ISF Tools	Integrated Solutions Framework Tools
IT	Information Technology

JRB	Joint Reserve Base
LADRA	Legacy Application Deployment Readiness Activity
MAF	Maintenance Action Form
MALS	Marine Aviation Logistics Squadron
MARCORSYSCOM	Marine Corps Systems Command
MCEN	Marine Corps Enterprise Network
MCOTEA	Marine Corps Operational and Testing Activity
MROC	Marine Requirements Oversight Council
NALC	Naval Aviation Logistics Center
NALCOMIS	Naval Aviation Logistics Command Management Information System
NAS	Naval Air Station
NET	NMCI Enterprise Tool
NETWARCOM	Navy Network Warfare Command
NGEN	Next Generation Enterprise Network
NIPR	Non-Secure Internet Protocol Router
NMCI	Navy Marine Corps Intranet
NTCSS	Navy Tactical Combat Support Systems
OCONUS	Outside Continental United States
OIMA	Optimized Intermediate Maintenance Activity application
OOMA	Optimized Organizational Maintenance Activity application
OT	Operational Test
PUK	Pack Up Kit
RAP Tool	Requirements To Award Process Tool
RCP	Remote Copy Protocol (Cisco)
Seat	A NMCI desktop or laptop computer
SIPR	Secure Internet Protocol Router
SLA	Service Level Agreement
SPAWAR	Space and Naval Warfare Systems Command
SSAA	System Security Approval Authority
TCP	Transmission Control Protocol
TIWG	Test Integration Working Group

UIC	Unit Identification Code
Unit ITR	Unit Information Technology Representative
USMC	United States Marine Corps
VPN	Virtual Private Network

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## **ACKNOWLEDGMENTS**

I would like to acknowledge all of the stakeholders of the Aviation Proof of Concept who provided a comprehensive view of a test project from concept to delivery. I would like to thank Marine Corps AISD personnel for all of the foresight into developing a functional environment for Marine aviation maintenance IT infrastructure into NMCI.

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## **EXECUTIVE SUMMARY**

The Aviation Proof of Concept (APOC) proved that Marine aviation could transition and operate on the NMCI network without any prolonged network interruption. The APOC Test Integration Working Group was composed of all of the stakeholders that had an interest in the operation of Marine aviation's Naval Tactical Command Support System (NTCSS) and the Navy and Marine Corps Intranet (NMCI). The APOC took project planning and system engineering to analyze and create a solution in order for Marine aviation NTCSS systems to be transitioned in NMCI without affecting Marine aviation operational readiness.

The APOC was a developmental/operational (DT/OT) test project that took the issues of Marine aviation maintenance IT systems to determine the requirements for transitioning the Marine Corps aviation IT assets into NMCI. The initial DT was a discovery phase to determine network functionality of the Marine NTCSS system and the rules and regulations related by the ambiguous NMCI contract. The DT produced several issues that the APOC TIWG sought to solve or mitigate in order for Marine aviation to transition into NMCI and for the APOC operational test to move forward. The OT was conducted at Marine Corps Air Facility (MCAF) Kaneohe Bay, Hawaii. This site was chosen because the base had Marine aviation and Navy aviation units located on the same base.

The APOC's first concern was the transition of MCAF Kaneohe Bay into NMCI. The transition began with the plan of continuing the transition while the APOC OT preceded as planned. The APOC OT was successful in many respects. Marine aviation can operate on the NMCI network. Also, Marine aviation software was standardized throughout the Marine aviation community. The issue of whether Marine units can use NMCI Deployable computers to was positively answered but brought up more issue of computer security and computer support.

The APOC was a success in that it provided processes and procedures for Marine aviation and NMCI to follow for the rest of transition phase of Marine aviation units.



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## **I. INTRODUCTION**

The Navy Marine Corps Intranet (NMCI) is a service contract between the Department of the Navy (DON) and Electronic Data Systems Corporation (EDS). The contract was awarded on 6 October 2000, for a period of seven years with a three-year option. The objective is to transfer the majority of the DON information technology assets over to the ownership and management of EDS. The United States Marine Corps (USMC) IT (information technology) assets are included as part of this contract. Navy IT assets, specifically Naval Aviation, were the first to be transitioned over to NMCI. The Marine Corps Systems Command (MARCORSYSCOM) Navy and Marine Corps Intranet (NMCI) program office had taken the lessons learned from the Navy's transition and developed processes to mitigate risks. Despite using these lessons learned, the USMC aviation community was reluctant to transition without a proven concept of operations. The hurdles our Navy counterparts endured created skepticism for USMC aviation users. In addition, there are vast numbers of software programs and operating systems that must undergo the scrutiny of change management. One of the last obstacles for transitioning USMC IT assets is to ensure that USMC aviation units could transition into NMCI without mission impact. These concerns were addressed by the Marine Requirements Oversight Council (MROC) that decided a proof of concept was in order to prove that USMC aviation units could operate in the NMCI environment.

The requirements from the USMC aviation community focused mainly on the Naval Tactical Combat System Support (NTCSS) suite of applications. The NTCSS suite of applications is a collection of aviation maintenance and logistics applications that are required in order for any aircraft maintenance action to be processed. The goal of transitioning USMC aviation units over to the NMCI environment would follow the Execution Discipline milestones established by the Marine Corps NMCI program office. However, the transitioning of USMC aviation units brought to the forefront issues that had either been neglected or never conceived.

The USMC's NMCI aviation plan included the largest percentage of "Deployable" computers, of which almost all USMC aviation seats will be in this category. The philosophy of conducting the Aviation Proof of Concept for USMC aviation is that it represents the most challenging aspects of transitioning, maintaining, and deploying users in and out of NMCI. While the proof of concept will include other NMCI Deployable issues, this study will examine only the transitioning of Marine Aviation IT assets to NMCI.

## **A. PURPOSE OF STUDY**

The purpose of this study is to analyze issues associated with transitioning USMC aviation squadrons and aviation logistics squadrons IT assets over to NMCI. The process of transitioning government IT assets is explained in "Execution Discipline." Execution Discipline sets the timeline and milestones in order to mitigate the risk in transitioning a site and/or users over to NMCI. USMC aviation and aviation logistics units must have risk mitigation in place before transitioning their IT assets over to NMCI. This is necessary because NTCSS applications are required to conduct day-to-day flight and maintenance operations. This study will participate in a pre-assessment to conduct developmental testing to identify issues of transitioning Marine aviation units into NMCI. The issues identified will then be analyzed by the APOC Test Integration Working Group (TIWG). It is this group's charter to successfully integrate USMC aviation into NMCI. The APOC is the test bed to determine whether Marine aviation can successfully transition and operate in the NMCI domain.

## **B. OVERVIEW OF CHAPTERS**

### **1. Chapter I**

Chapter I introduces the thesis and explains the purpose of the study. Each chapter's overview is explained as to the chapter's content.

### **2. Chapter II**

This chapter briefly describes the background of the NMCI contract and provisions related the issues of transitioning IT assets into NMCI. The constraints of

identifying and transitioning IT assets over to NMCI's control are the initial issues with which a command has to confront in transferring IT assets over to NMCI. Contract Line Item Numbers are the products and services that NMCI offers to DON users. These products generally involve desktop and laptop computers: upgrades of service and hardware performance, and any other additional services. Service Level Agreements are the contractual agreements on what an item is to receive in regards to services and performance. This is a performance-based contract where the contractor is rewarded or disciplined according to performance standards. Execution Discipline is the process that governs the NMCI transition milestones. These milestones start with identifying the infrastructure requirements of a site to the number of seats to be ordered by a command and/or site.

### **3. Chapter III**

Chapter III covers the APOC pre-assessment. This is the discovery test phase to uncover any unforeseen obstacles in operating the NTCSS applications and/or network infrastructure on NMCI network. The pre-assessment will also outline any alternate procedures for transitioning aviation seats over to NMCI. This chapter also discusses USMC aviations configuration management of aviation software. The Functional Area Manager (FAM) is responsible for all USMC aviation applications. These applications not only include the NTCSS suite but also any logistical and operational applications used by USMC aviation. The chapter will examine the test results and the conclusions brought forward by the APOC TIWG. The chapter will conclude with recommendations taken by the APOC TIWG in order to execute USMC aviations transition over to NMCI.

### **4. Chapter IV**

Chapter IV covers the Aviation Proof of Concept which is the operational test conducted at MCAF Kaneohe Bay, HI. It will cover the test preparations conducted by the APOC TIWG, the site transition office, and NMCI base operations at Kaneohe Bay, HI. The secondary objective for the APOC is to determine the functionality of using NMCI seats for USMC deployments.

## **5. Chapter V**

Chapter V provides the plans to transition Marine Corps NTCSS aviation servers over to the NMCI domain. The chapter explains the NMCI contract for CLIN 27 server connections and how they will apply to the Marine Corps aviation servers. The chapter concludes with an execution plan to transition the Marine Corps NTCSS servers over to NMCI.

## **6. Chapter VI**

Chapter VI covers the summary and conclusions of the APOC. The chapter summarizes the status of the issues identified and how they were or were not resolved. It gives a brief view of the next phase of the NMCI contract when it will be re-competed in 2010. The chapter concludes by discussing follow on research issues for Marine Corps aviation computers in the Marine Corps.

## **II. OVERVIEW OF NMCI**

This chapter provides a brief overview of sections of the NMCI contract that influenced the transition into NMCI. The Contract Line Items Numbers and Service Level Agreements associated with the NMCI contract are the products and services within the NMCI contract that affect the customers directly. The issues encountered in transitioning the Navy's IT assets over to NMCI provided a lessons learned for the creation of the Execution Discipline process created by the MCSC NMCI program office transition team and EDS. Execution Discipline provided a basic template to transitioning U. S. Marine Corps aviation IT assets over to NMCI. The chapter also discusses the impacts to USMC aviation IT activities due to the transition of IT assets over to NMCI.

### **A. OVERVIEW OF TRANSITIONING TO NMCI**

#### **1. NMCI Contract Goals**

The principal goal of EDS was to transition and integrate all identified DON networks into one single network. This includes all Navy's non-secure internet protocol router (NIPR) and secure internet protocol router (SIPR) networks located in the Continental United States (CONUS);<sup>1</sup> U. S. Marine Corps CONUS installation's NIPR and SIPR networks; and the Marine Corps installations outside the Continental United States (OCONUS).<sup>2</sup> The transition includes all Marine Corps and Navy's IT assets that have been identified for cutover. The standardization of hardware, software, and networks would enable the DON to have a homogeneous network vice the splintered systems it possesses. The benefits of integrating the DON network and employing configuration management throughout the environment has never been disputed, however, IT assets have never been under the control of one entity before. The transitioning of the Marine Corps' and Navy's IT assets over to EDS brought to the

---

<sup>1</sup> CONUS – Continental United States – States that reside in the boundaries of North America of the United States

<sup>2</sup> OCONUS – Outside Continental United States – Territories, states, and countries that are outside the continental United States (i.e., Hawaii, Puerto Rico, and Guam) SIPR and NIPR networks located in the Far East. CONUS sites for the USMC are designated to include all forty-eight continental states and Hawaii. The Marine Corps defines its OCONUS sites in the Far East as Japan and Okinawa.

surface the vast amount of uncorrelated networks, computers, and software programs spread throughout the DON. EDS initially attempted to transition the entire Navy enterprise wide. This met with miserable results from the lack of coordination between the management, the warehouses, installation, and users. The requirements by the DON to operate legacy applications resulted in users having two computers on their desks, one for the legacy network and one for NMCI network.

Under the current contract EDS is only reimbursed at 85% until a site transitions over 50% of its IT assets. EDS has been transitioning assets for the total time of the contract due to the diverse nature of the DON's IT structure. As of June 2005, EDS had yet to transition any USMC site over 50% to NMCI. This miscalculation has resulted in prolonged delays in assuming responsibility and control of the DON's IT assets. Despite the transition statistics, in 2005, EDS finally took assumption of responsibility of all U. S. Marine Corps IT assets and network management of all assets. An area of responsibility (AOR) entails that EDS is responsible for not only NMCI networking issues but must also support the operation of USMC legacy networks until transitioned into NMCI.

## **2. Mission Impact—Issues of Using an Outside Vendor**

The two big changes to the way users will operate in NMCI. The first change is that users do not have administrative rights to their computers that they were accustomed to in the past. Most users were able to configure their own computers, install new software, and do virtually anything else that they wanted to do. After transitioning a computer over to NMCI, a user loses all of these privileges, even the Unit Information Technology Representative (Unit ITR). All of the configuration management, network services, and network security are handled by NMCI while in garrison with oversight by the government. Benefits to this architecture are that configuration management is established at an enterprise level. This effects how the Unit ITRs support their commands' routine IT problems while in garrison. Traditionally, a new user would join their unit and an account would be created by the Unit ITR. The Unit ITR would also be responsible for getting computers repaired, redirecting e-mail, etc. There was a significant amount of responsibility placed on the Unit ITR for the daily inner workings

of a command's IT services. Now with a service provided by a vendor, all of these functions are removed from the Unit ITRs' control while the computers are attached to the NMCI network. All trouble calls are handled by the NMCI help desk.

The second significant change is the security posture of the NMCI network. The security directives flow down the chain of command from the Department of Defense (DoD), DON, Naval Network Warfare Command (NetWarCom), and Marine Corps Network Operations & Security Command (MCNOSC) who take direction from the Marine Corps Designated Approving Authority (DAA). The DAA approves all network connections where they are granted an Authority To Connect (ATC)<sup>3</sup> and an Authority To Operate (ATO).<sup>4</sup> All systems connected to the NMCI network must have an approved System Security Approval Authority (SSAA). Software applications are also tested and approved by the DAA, NMCI, DRPM, and the MCSC NMCI PM office. The initial applications were either designated commercial or a program of record and were granted an ATC and ATO on the Marine Corps COI.<sup>5</sup> This will help reduce the network and software vulnerabilities from users who infect the network by installing unauthorized software.

### **3. Standardization—NMCI Effects on Configuration Management**

The Navy and Marine Corps as a whole have been divergent in IT standardization for many years but also within each service there are differences from different commands and geographical regions. The Marine Corps has three distinct geographical areas; West coast (southern CA area); East coast (North Carolina, South Carolina) and the Far East (Okinawa, Japan). Each region has its own schedule for transitioning but must also fit into the overall scheme. The problems encountered in one region could possibly be encountered in one or all of the other regions. The need for standardization is

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<sup>3</sup> Authority To Connect (ATC) – The DAA approves a system or network to connect to the main network. This is granted after the required security measures and documentation have been submitted and approved by the DAA. An interim ATO (IATC) can be granted temporarily by the DAA.

<sup>4</sup> Authority To Operate (ATO) – The DAA approves a system or network to connect to the main network. This is granted after the required security measures and documentation have been submitted and approved by the DAA. An interim ATC (IATO) can be granted temporarily by the DAA.

<sup>5</sup> Community of Interest (COI) – A shared relation or interest. In this case it relates to all IT equipment that is connected to the Marine Corps NMCI network



not only for the Marines and for the Navy but it should also include joint standards as well. There are many areas of standardization that are going to affect NMCI, but for this segment, we will only discuss the top priorities.

**a. Hardware** – The hardware is ordered as a certain Contract Line Item Numbers (CLIN)<sup>6</sup> item. The CLIN's for hardware are broken down to either desktops or laptops. From there the difference in categories depends on the amount of performance in the hardware. Depending on a command's allocated budget for IT, it can upgrade its hardware order with additional features or performance.

**b. Software** – The basic software load for all NMCI seats is contained in the software bundle designated Gold Disk version 2.14. This includes the programs EDS requires in order to manage the seat and basic Microsoft Office software. The standardization of software on the government side comes from the process of having to submit required software for each site so that it can be tested. This process is known as Legacy Application Deployment Readiness Activity (LADRA). LADRA testing ensures that all required software will operate at a particular site. It is a requirement for each site to begin NMCI transition.

**c. Bandwidth** – The infrastructure was initially to be replaced with fiber optics by NMCI, however, due to the vastness and time this would have taken it was decided to only to build infrastructure where it was needed. It is EDS's responsibility to ensure that the infrastructure will support the network at each individual site. This is accomplished through site testing of available bandwidth. EDS reserves 20% of the bandwidth for surge capacity.

#### **4. Contract Line Item Numbers (CLINs)**

EDS lists the services and products it provides to users by CLINs. The CLINs describe the available types of hardware, software, and services offered by NMCI. These CLINs are ordered by CTRs who represent units in ordering the type and quantity of seats they will be receiving when their current computer is transitioned over to NMCI.

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<sup>6</sup> Contract Line Item Number (CLIN) – A CLIN item is a particular service or product provided by the NMCI vendor. For example, a CLIN 0004AC is a non-ruggedized deployable laptop computer.

The CLINs are listed on the NMCI Web site. The CLIN 0004AC is the laptop that will be used by the USMC aviation community.

## Non-Ruggedized Deployable Portable Seat

**CLIN 0004AC**

**Price: \$333.97 per month**

The Non-Ruggedized Deployable Portable (Deployable Portable) seat allows for the periodic deployment and use in an expeditionary or field environment. Deployable Portable seats shall be capable of interfacing with IT-21 shipboard networks and the Marine Corps Tactical Network (MCTN).



Reconfiguration to interface with IT-21 or other non-NMCI (e.g., Disembarked) network is not the responsibility of the NMCI Information Strike Force. Reconfiguration for return and interface with NMCI is a responsibility of the NMCI Information Strike Force.

The included workplace services can be viewed in the [Seat CLIN Services page](#). The current PC hardware and software specifications are available in the Standard Seats/Portable Workstation section of the [eMarketplace browser](#). **The delivered PC configurations may vary** from what is listed based upon units available for placement.

The Deployable Portable Seat CLIN can be upgraded by the following CLINs:

- [CLIN 0007 - High-End Seat Upgrade](#)
- [CLIN 0009AA - Classified Connectivity Upgrade](#)
- [CLIN 0009AC – Switchable Classified \(Dual CPU Solution\)](#)
- [CLIN 0009AE – Switchable Classified \(Dual CPU Solution/White\)](#)
- [CLIN 0009AF – Switchable Classified \(Dual CPU Solution/Blue\)](#)
- [CLIN 0009AG – Switchable Classified \(Dual CPU Solution/Portable\)](#)
- [CLIN 0009AH – Switchable Classified \(Dual CPU Solution/Non-Ruggedized Deployable Portable\)](#)

The following specifications depict the hardware and software included in the CLIN. However, **the delivered PC configurations may vary from what is listed** based upon units available for placement.

Additional CLIN service offering details are available in the Services section of NMCI Homeport. Copy and paste the URL <http://www.homeport.navy.mil/services/clin/> in a new browser to access the NMCI Homeport CLINs.

Hardware Specifications	Software Specifications
<ul style="list-style-type: none"> <li>• Notebook PC (Weight 4-5 lbs.)</li> <li>• Pentium M 750 (1.86Ghz)</li> <li>• 1.0GB DDR2-667 SDRAM (1 DIMM)</li> <li>• 40GB hard disk</li> <li>• CD-RW/DVD Combo Drive</li> <li>• 14.1 XGA active matrix (TFT) display</li> <li>• Integrated Audio</li> <li>• Network Interface Card</li> <li>• CAC Reader</li> <li>• 56K modem</li> <li>• 6 cell primary battery</li> <li>• Nylon Carrying case</li> <li>• USB Keyboard</li> <li>• USB Optical Mouse</li> <li>• Monitor Stand</li> <li>• Port Replicator</li> <li>• 17" CRT Monitor</li> </ul>	<ul style="list-style-type: none"> <li>• Windows XP* or 2000</li> <li>• Internet Explorer and Communicator</li> <li>• Smart Card Support</li> <li>• NetMeeting</li> <li>• Real Player &amp; Windows Media Player</li> <li>• WinZip</li> <li>• Antivirus Protection</li> <li>• PDF Viewer</li> <li>• TN3270 Client &amp; VT100 Emulation</li> <li>• Remote Management Software</li> <li>• Standard Office Automation Software: <ul style="list-style-type: none"> <li>○ MS Word</li> <li>○ MS Excel</li> <li>○ MS PowerPoint</li> <li>○ MS Access</li> </ul> </li> <li>• Microsoft Exchange/Outlook <ul style="list-style-type: none"> <li>○ Active Directory Driven</li> </ul> </li> <li>• Desktop Management <ul style="list-style-type: none"> <li>○ Electronic Records Management</li> </ul> </li> </ul>

Figure 1. Description of a CLIN 0004AC<sup>7</sup>

## 5. Service Level Agreements (SLAs)

The SLAs<sup>8</sup> are agreements between the government and EDS that define the metrics for each type of service provided by NMCI in relation to CLINs. Each CLIN product has certain SLAs associated with it that define the types of services it is expected to receive. Figure 2 outlines the SLAs in the NMCI contract for a computer while attached to the NMCI network.

**SERVICE NAME: END-USER PROBLEM RESOLUTION**  
**SLA: 101**

***Performance Category: End User Problem Resolution***  
***Increment 1 SLAPC: 101***

**SERVICE NAME: NETWORK PROBLEM RESOLUTION**  
**SLA: 102**

***Performance Category: Network Problem Resolution***  
***Increment 1 SLAPC: 102***

**SERVICE NAME: END-USER SERVICES**  
**SLA: 103**

<sup>7</sup> Figure 1 taken from the NMCI Web site in 2006. (<https://www.homeport.navy.mil>)

<sup>8</sup> Service Level Agreements – SLAs are performance metrics used by the government to measure EDS's performance on the NMCI contract.

**Performance Category: E-mail Services - User E-mail Availability**  
**Increment 2 SLAPC: 103.1.1**

**Performance Category: E-mail Services - E-Mail End-to-End (Client-Server-Server-Client Performance**  
**Increment 2 SLAPC: 103.1.2**

**Performance Category: E-mail Services - E-Mail Server Service Availability**  
**Increment 1 SLAPC: 103.1.3**

**Performance Category: E-mail Services - E-mail Client Responsiveness**  
**Increment 2 SLAPC: 103.1.4**

**Performance Category: Web and Portal Services**  
**Increment 2 SLAPC: 103.2**

**Performance Category: File Share Services – Server Availability**  
**Increment 1 SLAPC: 103.3.1**

**Performance Category: File Share Services – Client Responsiveness**  
**Increment 1 SLAPC: 103.3.2**

**Performance Category: Print Services**  
**Increment 1 SLAPC: 103.4**

**Performance Category: Network PKI Logon Services**  
**Increment 1 SLAPC: 103.5**

**Performance Category: Problem Resolution for Access to Government Applications Increment 1**  
**SLAPC: 103.6**

**Performance Category: RAS Services – Service Availability**  
**Increment 1 SLAPC: 103.7.1**

**Performance Category: RAS Services – Client Responsiveness**  
**Increment 1 SLAPC: 103.7.2**

**Performance Category: Blackberry Services**  
**Increment 1 SLAPC: 103.8**

**SERVICE NAME: HELP DESK**  
**SLA: 104**

**Performance Category: Average Speed of Answer - Telephone Calls**  
**Increment 1 SLAPC: 104.1.1**

**Performance Category: Average Speed of Response – Voice Mail/E-mail**  
**Increment 2 SLAPC: 104.1.2**

**Performance Category: Call Abandonment Rate**  
**Increment 1 SLAPC: 104.2**

**Performance Category: First Call Resolution**  
**Increment 1 SLAPC: 104.3**

**SERVICE NAME: MOVE, ADD, CHANGE**  
**SLA: 105**

**Performance Category: Move, Add, Change**  
**Increment 1 SLAPC: 105**

**SERVICE NAME: INFORMATION ASSURANCE SERVICES**

**SLA: 106**

***Performance Category: Security Event Detection  
Increment 1 SLAPC: 106.1***

***Performance Category: Security Event Reporting  
Increment 1 SLAPC: 106.2***

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Conformed Contract P00129

***Performance Category: Security Event Response  
Increment 1 SLAPC: 106.3***

***Performance Category: Configuration Management  
Increment 1 SLAPC: 106.4***

**SERVICE NAME: NMCI INTRANET**

**SLA: 107**

***Performance Category: Availability  
Increment 1 SLAPC: 107.1***

***Performance Category: Latency/Packet Loss  
Increment 1 SLAPC: 107.2***

***Performance Category: Voice and Video Quality of Service  
Increment 1 SLAPC: 107.3***

Figure 2. NMCI Service Level Agreements<sup>9</sup>

## **6. Execution Discipline**

The Marine Corps Systems Command's NMCI PMO used the lessons learned from the Navy's NMCI transition to help avoid costly mistakes and delays. Execution Discipline is a process created to avoid the duplication of errors created with the Navy's transition to NMCI. The process was created by the Marine Corps NMCI program office and EDS. It establishes milestones to be met in order to facilitate a smooth transition of government IT assets over to the control of NMCI. Three decision meetings outline the required input and the expected output of each of the meetings. The ED process starts once DM1 is deemed successful. DM1 is aimed at the high-level design of the site. It identifies the requirements of the site to provide to the vendor. DM2s are where the detailed design is locked down. This is the most important DM of the three because it maps seats to wall plugs, finalizes the rationalized legacy applications list, and sets a site-segment transition plan. Locking down the order negates multiple changes on the

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<sup>9</sup> Figure 2 taken from the NMCI Homeport Web site in 2006. (<https://www.homeport.navy.mil>)

customers' part and allows EDS to concentrate on one order vice many changes. DM3 is the milestone that defines whether the site is ready to transition or not.

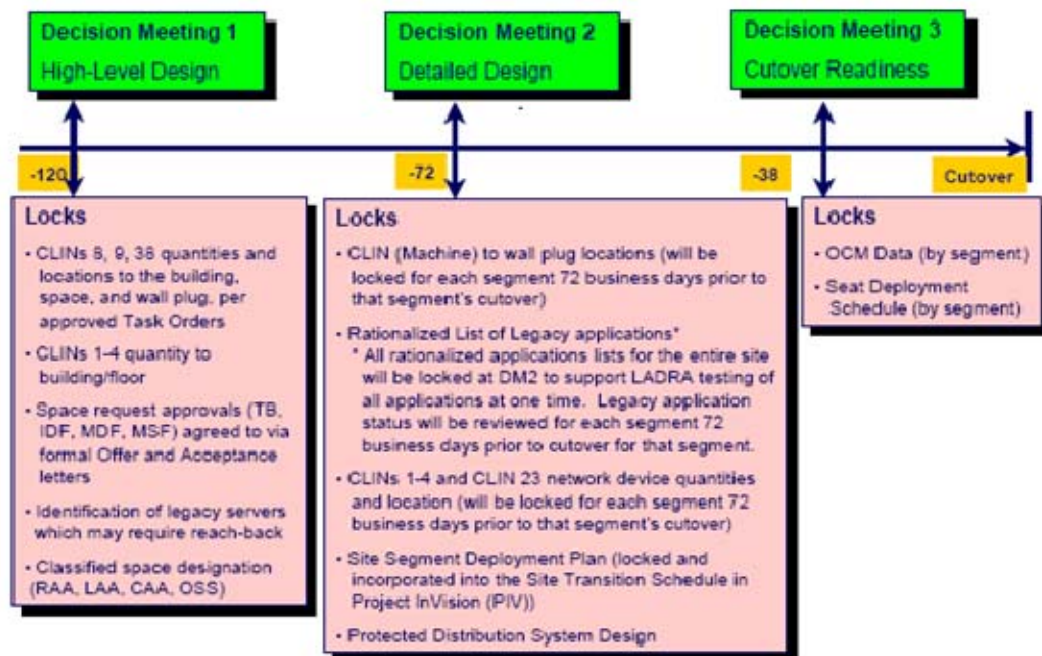


Figure 3. Execution Discipline Decision Meeting Matrix<sup>10</sup>

## B. OVERVIEW OF NMCI IN MARINE CORPS AVIATION

### 1. NMCI's Goals for USMC Aviation

The principal goal still remained to get all U. S. Marine Corps IT assets transitioned over to the control of NMCI. The challenges that aviation presents is that the hardware and legacy software applications that are to be transitioned are used on a daily basis for operations. Any prolonged delay in transitioning assets USMC aviation IT assets over to NMCI is unacceptable. The impact of non-functioning computers for aviation could result in degraded mission capability and possibly cripple the squadron's maintenance activities. This is the main reason why Marine aviation has delayed transition since the aviation information systems are vital for daily operations. Navy aviation has provided some proof that NTCSS application will work on NMCI. Navy

<sup>10</sup> Figure 3 taken from the USMC NMCI PM brief on Execution Discipline.

squadrons were some of the first to transition to NMCI. The Navy squadrons were using NMCI computers but they also had a legacy computer next to it because the NTCSS servers were outside NMCI through two boundaries (B2). The difficulties that the Navy squadrons faced by being the first to transition did nothing to promote the overall acceptance of outsourcing IT services to NMCI.

## **2. Mission Impact—USMC Aviation Programs Affected by NMCI**

The two types of Marine aviation units affected by transitioning to NMCI: Marine Aviation Logistics Squadrons (MALs) and USMC flying squadrons must execute a seamless transition. Of all of the issues encountered, the computers used for maintenance purposes are the number one concern. A USMC aviation flying squadron can be divided into two different areas: maintenance and the squadron's support shops that include operations, logistics, and safety. The maintenance side of an aviation flying unit is the prominent user of the NTCSS applications. Marine Aviation Logistics Squadrons business is to track, repair, and supply aviation parts to the flying squadrons. A MALs is an intermediate maintenance activity (IMA) which supports a Marine Air Group (MAG). A MAG consists of several flying units of which can be of different type aircraft.

SPAWAR PMW-150 is the owner of the NTCSS applications. The NTCSS applications are the suite of applications that the maintenance departments of all aviation units use in their daily tasks. The NTCSS suite was created by the merger of three programs:

SNAP – Shipboard Non-Tactical Automated Data Processing Program

MRMS – Maintenance Resource Management System

NALCOMIS – Naval Aviation Logistics Command Management Information System

From this, the NTCSS suite consists of four applications:

R-ADM – Relational Administrative Data Management

RSupply – Relational Supply

OMMS-NG – Organizational Maintenance Management System – Next Generation

NALCOMIS – Naval Aviation Logistics Command Management Information System

These are the vital aviation maintenance applications that must be validated and verified to operate on the NMCI network.

### **3. Standardization—NMCI Effects on Configuration Management in Marine Aviation**

SPAWAR's PMW-150 provided computers and printers for USMC aviation maintenance functions. With the NMCI transition, they no longer provide computers but still provide printers for tactical use. PMW-150 also dictates the network links and IP addresses for the NALCOMIS servers. In addition, PMW-150 provides configuration management for the NALCOMIS software for both the Marine Corps and Naval aviation units. The overall scheme has not changed except now it must be certified and approved to be on the NMCI network.

### **4. Key Policies and Regulations for USMC Aviation Maintenance Programs**

OPNAVISNT 4790.2J is the document that oversees Naval aviation aircraft maintenance procedures and processes. PMW-150 and the FAM for Marine Corps aviation set the standard and guidelines for using NTCSS suite.

## **C. IMPACT OF NMCI ON USMC AVIATION**

### **1. Mission Impact—Change Management Effects on Marine Corps Aviation Operations**

The process of operating and maintaining the NTCSS software, hardware, and networks, while in garrison or on deployment has been the responsibility of the USMC's Aviation Information Systems Department. The Marines who are responsible for the NTCSS applications possess the same IT skills of any comparable IT organization's IT department. These same personnel who once ensured the NTCSS system was operational while in garrison will now only act as observers while in the garrison environment. Hardware is supplied by EDS in the form of a CLIN order. In USMC aviations case these will be almost exclusively CLIN 0004ACs. Software is also provided by NMCI that includes both COTS and GOTS. Seats are ordered with the software bundle the user



orders to enable him or her to do their respective job. Network connectivity is also the responsibility of EDS. Therefore, while in garrison, all configuration management issues and IT problems are the responsibility of NMCI.

The other side of the issue is that when the Marine unit deploys outside of NMCI, the responsibilities of establishing and maintaining the NTCSS system goes back to the control of AISD.

## **2. Standardization—Standardization of IT Assets in Marine Corps Aviation Units**

Standardizing the hardware, software, and network connections should only improve the USMC's NTCSS posture. The USMC aviation FAM is responsible for all aspects of configuration management in relation to Marine Corps aviation maintenance. The two main standardization features will be:

- Hardware – This will be the same CLIN ordered by each unit thus enabling computers to be swapped out or replaced for repair.
- Software – By loading all of the available NTCSS applications on the computer, it can be used by more than one person to accomplish tasks. Furthermore, by standardizing the version of all software enterprise wide, this enhances compatibility between the different squadrons.

## **3. Key Policies and Regulations—Current Policies and Regulations Affected by the Transition to NMCI**

The overall policy regarding transitioning USMC IT assets over to NMCI is the NMCI contract. The contract can be amended only by the designated contracting officer. Other documents to facilitate transition such as the Execution Discipline are merely guidelines for effective processes.

### **III. AVIATION PROOF OF CONCEPT PRE-ASSESSMENT**

This chapter covers the Marine Corps Aviation Proof of Concept developmental test conducted at Camp Pendleton, CA, in January 2005. The development test (DT) <sup>11</sup> was conducted in order to discover technical and procedural obstacles in transitioning USMC aviation maintenance applications to the NMCI network. The technical issues discovered during the DT would be addressed by the APOC Test TIWG.<sup>12</sup> The procedural checklist of the Execution Discipline framework was the baseline from which to apply necessary changes in transitioning USMC aviation IT assets to NMCI. Marine Corps Test and Evaluation Activity was tasked with preparing and executing the APOC pre-assessment. The APOC pre-assessment goal is to find the real issues before the operational test to be conducted later. The chapter concludes by outlining the issues that the APOC TIWG identified as those that will hinder the transition of Marine aviation IT assets to NMCI.

#### **A. DEVELOPMENTAL TEST PREPARATIONS**

The APOC Pre-Assessment was conducted at I Marine Expeditionary Force's (MEF) Battlefield Simulation Center (BSC) aboard Camp Pendleton, CA, from 24 January to 4 February 2005. The DT was engineered and executed by MCOTEA. The pre-assessment had two main goals: (1) Confirm that the NTCSS suite of applications would work on the USMC NMCI COI; (2) Establish a working group to identify and coordinate issues encountered during U. S. Marine Corps aviation's IT assets transition into NMCI network.

##### **1. Seat Transition**

The computers used for the APOC pre-assessment were NMCI CLIN 4ACs, ordered through the regular NMCI ordering process utilizing the electronic marketplace. The enterprise UIC for USMC PM NMCI office was used which created problems with

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<sup>11</sup> Development Test (DT) – A development test method attempts to solve problems as they occur.

<sup>12</sup> Test Integration Working Group (TIWG – The APOC TIWG included stakeholders (see Appendix C) to identify and address issues of the Marine Corps Aviation Proof of Concept.

the ordering process. Ordering seats had always related a single seat with an identified user. In this case, the seats were not mapped to a user, but to the Marine Corps PM NMCI office. Upon investigating the status of the seats as the date for the pre-assessment grew near, it was determined that the seats had never been created at the NMCI warehouse because no user or applications were mapped to the seats. This created another dilemma in that the applications being used were not yet tested for the NMCI network on the USMC COI.

A waiver was granted by the NMCI DRPM office to allow the seats to be loaded with the NTCSS suite of applications for the DT. This was purely administrative since the NTCSS suite is a legacy application and approved on the USMC legacy network by the USMC aviation software functional area manager (FAM).<sup>13</sup>

## **2. Training**

MCOTEA provided test training to the identified test subjects and test controllers in order to conduct the test effectively. The test training for the subjects consisted of the parameters of reporting data for the test. The test controllers also received instruction on how to translate test data and document it for the overall test report. This training was to ensure the proper results were recorded for analysis. The APOC TIWG also identified that the test subjects would require NMCI Deployables training. The Deployables training was not restricted to just the test subjects but also included test controllers and local CTRs who support local units. The Deployables training was primarily for the test subjects who would be deploying their seats from the NMCI network. The Deployables training was for knowledge of how the Deployables process works on NMCI. This training was also abbreviated to the test controllers to ensure they understood the NMCI Deployables process. The Deployables training team from MCSC conducted Deployables training for the test subjects. This was the standard training curriculum being taught by the Deployables training team throughout the Marine Corps. The Marine Corps NMCI Deployables training consists of:

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<sup>13</sup> Functional Area Manager (FAM) – A FAM is responsible for the enterprise of a certain area. In this case the USMC aviation FAM is responsible for all aviation software. The FAM approves or disapproves changes to USMC aviation software.

- The documents for the processes and procedures were highlighted for reference to the individuals for further learning.

The diagram illustrates a network topology with the following components and connections:

- Intranet:** Connected to a 3550-12G router (LMR PNDL 01, Bldg 2459, Area 24).
- UTB:** Connected to the 3550-12G router and two 6509 routers (PNDL-U08-DR-01, PNDL-U08-DS-01).
- 6509 Routers:**
  - 6509 PNDL-U08-DR-01, PNDL-U08-DS-01 (Area 11): Connected to the UTB and the 3550-12G router.
  - 6509 PNDL-U08-DR-01, PNDL-U08-DS-01 (Area 23 Zone 9): Connected to the GigE Core and the 3550-24 router (PNDL-U09-AS-48, Bldg 2394, Rm Telco).
  - 6509 PNDL-U13-DR-01, PNDL-U13-DS-01 (Area 21 Zone 13): Connected to the ATM Core and the 3550-24 router (PNDL-U13-AS-18, Bldg 210702, Rm 124 VR000272).
- 3550-24 Routers:**
  - PNDL-U09-AS-48, Bldg 2394, Rm Telco: Connected to the 6509 router in Area 23 Zone 9.
  - PNDL-U13-AS-18, Bldg 210702, Rm 124 VR000272: Connected to the 6509 router in Area 21 Zone 13.
- Core Routers:**
  - GigE Core (Daisy Chain Phy):** Connected to the 6509 routers in Area 11 and Area 23 Zone 9.
  - ATM Core (Daisy Chain Phy):** Connected to the 6509 routers in Area 21 Zone 13 and Area 23 Zone 9.
- Other Components:**
  - OC-12:** Connected to the 3550-12G router and the ATM Core.
  - Marconi CSX 1000 PNDL-U08-CS-01:** Connected to the ATM Core.
  - Cisco 3550-24:** Two units connected to the ATM Core.
  - DP-17 CLIN27AG:** A server rack containing:
    - JATDI Server 1 .4, RSUPPLY Server .8
    - JATDI Server 2 .5, IMA Server .9
    - Additional Resource Server 1 Not Needed, Resource PDC Not Needed
    - Additional Resource Server 2 Not Needed, Resource BDC Not Needed
  - Delmar Area for PPOC Bldg 210702 Cell 9:** A server rack containing:
    - CLIN27AG OMA Nalcomis Server .20
    - CLIN006AB Legacy Printer .21
  - Other Servers/Printers:**
    - XXX.XXX.172.0/28 (VLAN 291)
    - XXX.XXX.172.16/28 (VLAN 442)
    - NMCI Printer XXX.XXX.x.x/24

<sup>14</sup> Figure 4 taken from Pre APOC report dated January 2005.

The network architecture for the test used existing NMCI wall plugs located in the I MEF BSC. A NTCSS Organizational Maintenance Activity (OMA)<sup>15</sup> server was also attached to represent a USMC aviation squadron.

This OMA server was attached to at the I MEF BSC and linked to the network to an NTCSS IMA server located at Camp Pendleton's airfield. The network represented in figure 4 represents a typical NTCSS network for a Marine aviation unit. The issues that were initially brought up were the network connections to Navy commands.

#### **4. Test Criteria**

The test criterion was developed by MCOTEA by referring to NTCSS, NMCI Deployables, and EDS documents. The CLINs describing the seat services only refer to a seat being supported by NMCI. The NMCI contract did not specify the specifics of what kind of support the seat would receive while deployed and while in garrison. The following are the relevant test criteria related to the DT.

*Criterion 1:* Solution will permit each flying squadron to maintain a set of information resources that support operations in garrison and deployed. These include, but are not limited to CSS servers and application servers, shared data storage (servers and/or NAS), CSS application report printers.

*Criterion 2:* Solution must provide unit IT real-time visibility of status of all seats (deployed, not deployed).

*Criterion 3:* Solution must provide tools, data, and component condition supporting rapid integration into tactical network environment and return into the NMCI environment. This may include but is not limited to batch creation of user accounts and data, critical applications, workstation accounts, mailboxes.

*Criterion 4:* Solution will provide availability of mission critical systems, applications, and organizational data through the embarkation phase.

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<sup>15</sup> Organizational Maintenance Activity (OMA) – Aircraft maintenance and equipment used at the squadron level.

*Criterion 5:* Solution will provide a validated PUK for any other deployment delivered within 96 hours of request.

*Criterion 6:* Solution must support operability/interoperability (as required) for all mission critical applications (critical MOSs, process steps).

*Criterion 7:* While in garrison, solution will permit the unit to manage CSS (NTCSS Programs of Record) report printers and information systems, which are accessible by all authorized users at all times.

*Criterion 8:* Solution must provide access to these systems [including, but are not limited to: CSS servers and application servers, shared data storage (servers and/or NAS), and CSS application report printers] from NMCI seats.

The criterion that MCOTEA set for the APOC pre-assessment covered the both the network connectivity issues along with NMCI Deployables support measures.

## **B. DEVELOPMENTAL TEST**

The DT was conducted using the criteria created for the APOC pre-assessment, which was provided by MCOTEA with input from MCSC Deployables training team, EDS Deployables team, and HQMC Aviation. The test criteria was developed from the NMCI contract CLINs, which describe the services a particular seat should receive. The Deployables Working Group, of which, the MCSC Deployables lead co-chairs, had created guidelines to assist the deployable users. While these documents are not contractual, they provided a baseline of processes and procedures for the Deployable CLINs that were agreed upon by the DWG. The test was conducted by using tasks that a Marine AISD tech would be expected to perform in his/her daily duties.

### **1. Network Architecture**

The network used for the APOC pre-assessment was setup in the I MEF BSC utilizing NMCI wall ports (CLIN 6AB) that had been previously used by the USMC Deployables training team to conduct Deployables training. PMW-150 from SPAWAR San Diego also setup an OMA NALCOMIS server at the BSC. This OMA server

functioned as a squadron OMA server from which actual aircraft maintenance trouble tickets were entered. The OMA server was connected to MALS-39 IMA server through the NMCI network. This network configuration represented how a Marine aviation unit would be connected through the NMCI network.

## **2. Conduct of Test**

The test was conducted in reference to MCOTEA's guidance. Testers were to perform their assigned daily tasks and report on the appropriate forms. Interference with the test was not allowed except to troubleshoot network issues. The test criteria were developed by MCOTEA utilizing their test procedures and policies. The CLIN 004AC describes the type of service a seat should receive while attached to the NMCI network. The criteria for these services are outlined in the NMCI SLAs. The DT was setup to be conducted in three phases. The first phase represented a Marine unit in garrison. The second phase was to demonstrate the ability to deploy the Marine aviation IT assets off of the NMCI network. The third and final phase was conducted to return the Marine aviation IT assets back to the NMCI network.

### ***a. Garrison Phase***

The garrison phase was set up in I MEF's BSC and connected through the CLIN 6AB wall ports already installed by NMCI. A NALCOMIS OMA server was set up as a Marine aviation garrison NTCSS server. This server was connected to the MALS-39 IMA server on MCAF Camp Pendleton, which acted as the OMA unit.

The test area was setup to parallel the tasks performed by Marine aviation maintenance personnel in their daily duties. The tasks included inputting MAFs, assigning maintenance tasks, and requesting replacement parts through the NTCSS system. Actual MAFs from MALS-39 and MALS-16 were used as the data input for the DT. This allowed the tracking of when a MAF was inputted into the NTCSS network to when it was resolved. These tasks were then traced by legacy NTCSS systems to verify that the actions were performed. The tasks performed during the pre-assessment are the

essence of a Marine aviation's maintenance division's workload. The initial result was that the Marine aviation NTCSS applications would function on the NMCI network.

***b. Deployed Phase***

The second phase of the DT was to determine whether Marine NTCSS applications would function after the NMCI computer was put through the deployment process, which is required to correctly uncouple the Deployable NMCI computer from the NMCI network. The NMCI Deployable laptop has a process in order for a Marine unit to successfully remove their IT assets from the NMCI environment and gain administrator rights to those IT assets. The other point of contention for the NMCI Deployables has been the Pack Up Kit. This is the spare laptops and software used to temporarily replace a broken NMCI laptop and/or reload the software while the computer is deployed. This was done to identify what the PUK actually contained to provide a baseline for further PUK requirements.

The ten NMCI Deployable laptops were identified to NMCI to start the deployables process. NMCI then created administrative passwords so that the Unit ITR had administrative privileges to the NMCI laptops. Administrative privileges to a computer are required so that the Unit ITR can join the Marine aviation unit's NMCI laptops to a Marine tactical network. Due to the testing nature of the deployment, only software was requested for the PUK. This was the NMCI gold disk, which would rebuild the NMCI computer software to the date the gold disk was created.

To demonstrate the validity of the reach back capability while detached from the NMCI network the ten pre-assessment laptops were taken to MCAS Miramar where they were connected to a legacy network. The only reach back capability at the time of the DT was through the NMCI dial-up remote access system. This was used to demonstrate that a Marine Corps aviation computer could connect back to the NMCI network while in a deployed status. NMCI had been working on providing broadband remote access capability but did not have it working at the time of the DT.



*c. Return Phase*

The return phase of NMCI Deployable computers is in essence a reverse process of the NMCI Deployables outgoing process. The Unit ITR must contact NMCI to initiate the return of the unit's NMCI deployable laptops to enable the NMCI computers the ability to rejoin the NMCI network. This will allow NMCI the appropriate amount of time to prepare the network for the returning NMCI computers. For the DT, the site preparation was not necessary due to the conduct of the test. The critical issues for the returning Marine aviation NMCI computers was to determine what would be the effect of re-imaging a Marine aviation NMCI computer with the NMCI gold disk software and what network security measures were in place to prevent a network breach.

**C. DEVELOPMENTAL TEST RESULTS**

The tests results provided a quick look at the requirements necessary to transition U. S. Marine Corps aviation over to NMCI. The plans and procedures used would resemble the current procedures already in place. The main emphasis of the pre-assessment was to highlight network connectivity and NTCSS applications issues. The test results were collected by MCOTEA, which produced an after action report.

**1. Test Criteria Results**

The results for the criteria were positive but also highlighted some deficiencies in the NMCI Deployables support functions. Although the primary goal of the DT was to determine NTCSS functionality, a number of NMCI Deployables processes were tested. The test criterion outlined below will provide a baseline for the OT.

Table 1. APOC Test Criteria Results

Criterion Comments Result		
1. Solution will permit each flying squadron to maintain a set of information resources that support operations in garrison and deployed. These include, but are not limited to; CSS servers and application servers, shared data storage (servers and/or NAS), CSS application report printers.	<ul style="list-style-type: none"> <li>• Printers worked in garrison and deployed.</li> <li>• Shared data storage was successfully established in garrison and rapidly deployed.</li> <li>• Applications performed successfully in garrison, remote site, deployed, and upon return to NMCI.</li> </ul>	Met
2. Solution must provide unit IT real-time visibility of status of all seats (deployed, not deployed).	<ul style="list-style-type: none"> <li>• Functionality not available to test.</li> </ul>	Not Tested
3. Solution must provide tools, data and component condition supporting rapid integration into tactical network environment and return into the NMCI environment. This may include but is not limited to: batch creation of user accounts and data, critical applications, workstation accounts, mailboxes.	<ul style="list-style-type: none"> <li>• Full Functionality not available to test.</li> <li>• Requirement not formally tested, but partially met with commercially available software.</li> </ul>	Not Tested
4. Solution will provide availability of mission critical systems, applications and organizational data through the embarkation phase.	<ul style="list-style-type: none"> <li>• Requirement scoped as 'low risk' by HQMC DCAVN rep prior to initiation of testing.</li> </ul>	Not Tested
5. Solution will provide a validated PUK for any other deployment delivered within 96 hours of request.	<ul style="list-style-type: none"> <li>• Aviation applications not provided.</li> <li>• Gold Disk out of date.</li> <li>• PUK received on time.</li> </ul>	Not Tested
6. Solution must support operability/interoperability (as required) for all mission critical applications (critical MOS's process steps).	<ul style="list-style-type: none"> <li>• All tested NTCSS applications were interoperable in garrison, remote sites, deployed, and upon return to NMCI.</li> </ul>	Met
7. While in garrison, solution will permit the unit to manage CSS (NTCSS Programs of Record) report printers and information systems, which are accessible by all authorized users at all times.	<ul style="list-style-type: none"> <li>• Unit ITRs and NTCSS administrators could: <ul style="list-style-type: none"> <li>o Map Printers</li> <li>o Create accounts</li> <li>o Configure apps</li> </ul> </li> </ul>	Met
8. Solution must provide access to these systems (including, but not limited to; CSS servers and application servers, shared data storage (servers and/or NAS), CSS application report printers) from NMCI seats.	<ul style="list-style-type: none"> <li>• Servers, applications servers, printers, and data stores were accessible from NMCI seats regardless of location.</li> </ul>	Met

The results of test criterion provided a reasonable assurance that USMC aviation can operate on the NMCI network. There were four major concerns that would need to be addressed before the OT: (1) Standardization of Marine aviation software applications; (2) Solution for NALCOMIS printers to be connected to the NMCI network; (3) DP-17 van pad connection to NMCI; and (4) Cross COI connectivity for NALCOMIS.

## **2. Test Issues**

### ***a. Aviation Applications***

The multiple versions of aviation maintenance applications listed in DADMS highlighted the requirement for the aviation FAM to establish a list of aviation maintenance applications to be used by Marine aviation units throughout the enterprise. The AISD chiefs from each of four Marine Aviation Wings along with HQMC AISD chief brought forward every software application that each of their respective air wings used. From this list, the group was tasked to go through the list of aviation applications pertaining to the Marine Corps aviation units and established a baseline of applications that all Marine aviations units would require to operate.

### ***b. Static IP Addresses for NTCSS Printers***

A NALCOMIS printer was used during the aviation pre-assessment at the I MEF BSC. In order for any of the test users to print to the NALCOMIS printer it had to be assigned a static IP by NetCo. This resulted in the issue that the NALCOMIS printer driver is imbedded in the NALCOMIS server and thus requiring a static IP address for the NALCOMIS printer to print maintenance action forms (MAFs). The current setup for CLIN 6A/B wall ports is to use a dynamic IP address.

### ***c. DP-17 Van Pad Connectivity***

The DP-17 van pad connectivity is essential if Marine aviation is to migrate to the NMCI network. A large part of a MALS unit consists of interconnected van pads vice an actual building. In essence, the DP-17 van pads are meant to deploy for a wartime situation but, in reality, they never are moved for that purpose. The issue of how to connect the DP-17 van pad to NMCI was added to the APOC TWIG list of issues.



Figure 5. DP-17 Van pad<sup>16</sup>

*d. Cross Community of Interest*

The cross community of interest is one of the key factors which precludes the Navy and Marine Corps Intranet from being a true intranet. In reality, the NMCI network is two distinct networks that are connected by a few portals. This network setup affects communication between Marine Corps and Navy commands that are located on the same base. Before NMCI, these commands were on the same base network where they could effectively communicate using shared services. Post NMCI removed this base network infrastructure thus placing Marine and Navy commands located on the same base to revert to other solutions in order to effectively communicate with one another. One of the main reasons the Marine Corps resists an all in one intranet with the Navy is because the Navy's IT infrastructure was deemed insecure by the Marine Corps IT decision makers.

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<sup>16</sup> Figure 5 taken from Pre APOC report dated January 2005.

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## **IV. AVIATION PROOF OF CONCEPT**

This chapter covers the interim period from the DT to the end of the operational test (OT) conducted at MCBH, Kaneohe Bay, Hawaii, in November 2005. The OT was conducted in order to assess the NMCI functionality of the NTCSS suite of aviation maintenance applications on NMCI machines in a garrison and tactical environment. This chapter covers how the APOC TIWG worked through the Marine aviation IT issues that were identified during the DT. The chapter highlights the critical milestones in preparing for the APOC to be conducted at MCAF Kaneohe Bay. The APOC OT is covered for the procedures and process taken to ensure the OT could be executed.

### **A. PRE-TEST—AVIATION PROOF OF CONCEPT**



Figure 6. MCAF Kaneohe Bay, HI

MCAF Kaneohe Bay was selected as the test site because it had both Marine Corps and Navy aviation units tenanted at the air facility. The Aviation Proof of Concept was to include an X-COI test in addition to the ones mandated by the MROC. Hanger 101 was used as the test center and the tactical environment. The hangar was used for the

initial phase in transitioning MAG-24's aviation computers to NMCI. The hangar office spaces were set up for the garrison test while the hangar floor was utilized to set up DP-17 van pads for the deployed scenario.

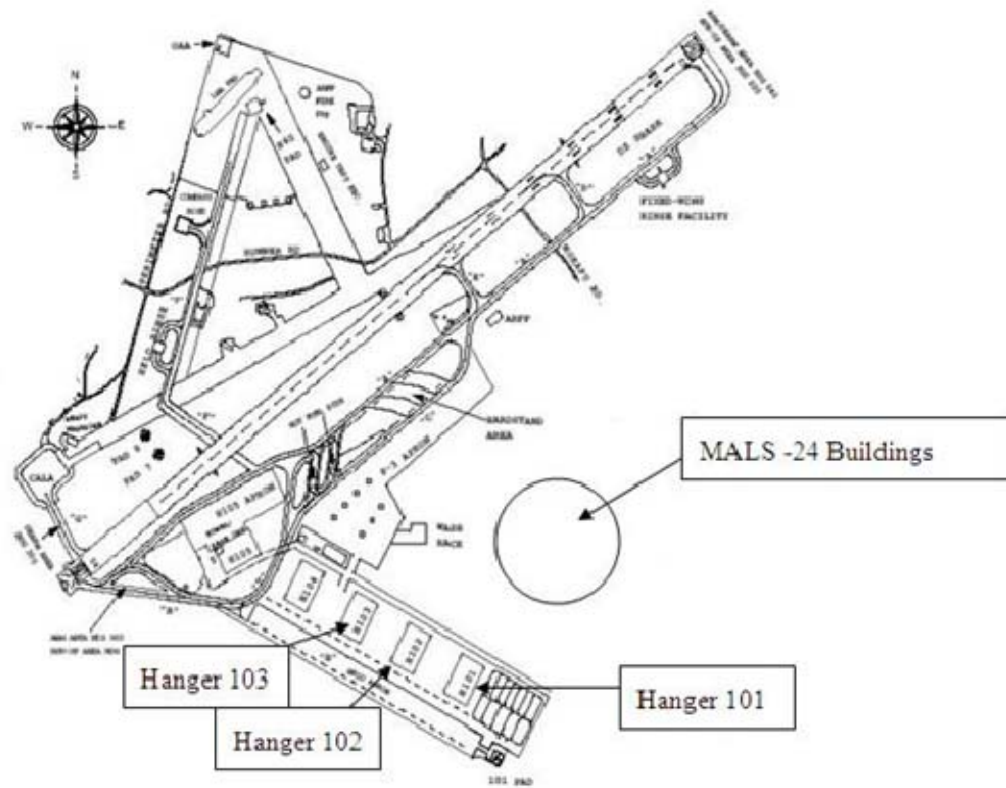


Figure 7. MCAF Kaneohe Bay Airport Diagram

Since the aviation pre-assessment in January 2005, the APOC TWIG had been working on solving and/or reducing the risk factor associated with the issue brought forward from the DT. The risk and mitigation plan followed the likelihood an issue would have and the consequences of issue on the program. Figure 8 is the risk and mitigation matrix was created for the four main APOC issues after the DT was completed. Figure 9 is the risk and mitigation matrix plan for those issues. As seen from the graphs, the likelihood and consequences of these issues is high.

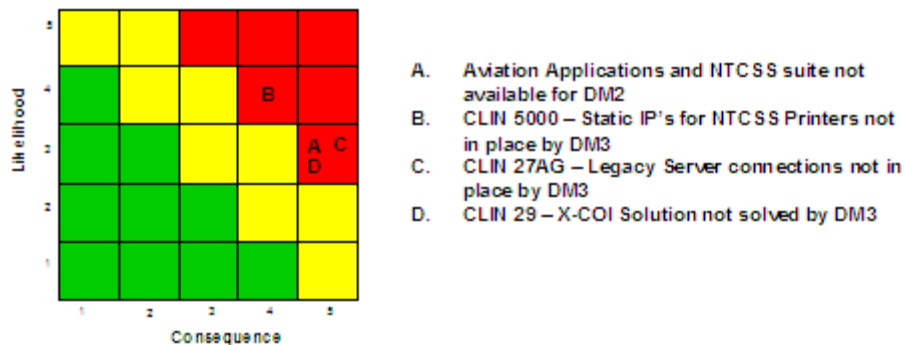


Figure 8. Marine Aviation NMCI Integration Risk Matrix Post APOC DT

ID	Risk and Mitigation	Type	LK	Cons	Level
A	RISK: Availability of Aviation applications.	Schedule	3	5	High
A1	MITIGATION: Aviation applications are on the Rationalized List of the Marine Corps. The FAM approved list is currently undergoing LADRA testing.	Schedule	2	4	Med
ID	Risk and Mitigation	Type	LK	Cons	Level
B	RISK: CLIN 5000 negotiated and ordered for NTCSS printers (static IP)	Schedule	4	4	High
B1	MITIGATION: An agreement between from contracts is required before any way ahead can be achieved. If solution is not finalized then connections will not be changed.	Service	5	3	High
ID	Risk and Mitigation	Type	LK	Cons	Level
C	RISK: MAL 8 van pads connectivity. Much of the MAL 8 Intermediate maintenance activity is conducted in mobile facilities that will be needed to be connected to the NMCI.	Schedule	3	5	High
C1	MITIGATION: The CLIN 0027AG legacy server connection process is being promulgated. The NTCSS servers will be cut over after all aviation seats have been cut over at a site.	Service	3	3	Med
ID	Risk and Mitigation	Type	LK	Cons	Level
D	RISK: USMC IMA support for Navy COI USN squadrons. USN aviation units aboard MCA 8's will need continued support from NTCSS service provided by MAL 8. The converse is also true where USMC tactical (reserve) squadrons are aboard USN facilities.	Schedule	3	5	High
D1	MITIGATION: ORPM NMCI directed a working group to provide a X-COI engineering solution that meets IA requirements by seat cutover. The DIAA has agreed to let the APOC test go ahead without a solution.	Service	2	5	Med

Figure 9. Marine Aviation NMCI Integration Risk and Mitigation Plan Post APOC DT

The Marine aviation integration risk matrix listed four main issues: (1) Marine aviation applications; (2) Static IPs for NTCSS printers; (3) CLIN 27 legacy server connections; and (4) X-COI connections. The CLIN 27 legacy server issue surfaced after the deliberations on whether X-COI would be finalized and whether if connecting the DP-17 van pads counted and one or multiple CLIN 27 legacy server connections.



The Marine representatives from the APOC TWIG also determined that in order for Marine aviation to transition to NMCI at MCAF Kaneohe Bay, and as added elements to the Executive Discipline, milestones had to be met. The USMC Aviation Critical Milestones are as follows:

- For all MALs
  - CLIN0027AG approved before DM1
- For all MALs & Squadrons before DM2
  - Aviation Applications
    - On Rationalized List
    - LADRA Tested
- For MALS & Squadrons w/ Cross COI Issues
  - Approved Solution needed before DM1
  - Navy may need to move NALCOMIS inside B1

	MAG HQ	MALs (IMA - No Cross COI)	Squadrons (OMA - No Cross COI)	MALs (IMA - Cross COI)	Squadrons (OMA - Cross COI)
<b>MAG Count</b>	14	7 to 11		3 to 7	
<b>DM1</b>	Can Proceed	Need Design Mods* Approved	Can Proceed	Need Design Mods* Approved; Need Cross COI** Resolved	Can Proceed
<b>DM2</b>	Can Proceed	Need Applications	Need Applications	Need Applications	Need Applications
<b>DM3</b>	Can Proceed	Can Not Proceed until LADRA complete	Can Not Proceed until LADRA complete	Can not proceed until LADRA complete	Can Not Proceed
<b>Seat Transition</b>	Can Proceed	Can Not Proceed	Can Not Proceed	Can Not Proceed	Can Not Proceed

**\* Design Mods**

CLIN0027AG availability for DP-17  
 6AB Static IP needed  
 Business / SLA Review

**\*\* Cross COI USMC C & A recommends all cross-COI seats wait until solution in place**

- Navy NALCOMIS needs to move to NAVY NMCI behind the B1
- SD / HI Regional Cross COI (Will there be a USMC B1 in HI?)

Figure 10. USMC Aviation ED Guidance Matrix

The APOC TIWG created the matrix in Figure 10 to determine the go/no-go criteria to proceed with the APOC test. The matrix enhances the execution discipline checklist used by NMCI transition teams.

The APOC TIWG had identified the risks from the DT and spent the time since then to fix the discrepancies through technical, management, or contract negotiations. MCOTEA was tapped as the lead test agency to conduct the APOC. They recommended that a test user base be set for forty computers to be transitioned before the APOC test thirty days in order to provide stability before the OT was conducted. The next critical step was to ensure that the Marine aviation maintenance applications were approved in DADMS and LADRA tested at MCAF Kaneohe Bay in order for the computer build out to proceed.

## **1. Network Architecture**

The network architecture was established by the EDS's subcontractor NetCo in accordance to meet SLAs for the NMCI contract. One of the important tasks in the process is for NetCo to complete build out (BIOS) of a site in order to support the network. The bandwidth requirement must not exceed 80% to allow a 20% surge capability. This is a critical factor if the network architecture is not capable of providing the necessary bandwidth. If the site undergoing transition does not meet network capability then NMCI is responsible for upgrading the network infrastructure. The network that NMCI contracted for included the infrastructure of the Marine Corps. MCAF Kaneohe Bay had an insufficient network, which required upgraded infrastructure to meet the SLA requirements. In order to meet the APOC timeline, emphasis had to be placed on the upgrade of the network infrastructure.

The other issue with the network architecture is related to the X-COI. Figure 11 shows an NTCSS network before transition into NMCI. Figure 12 outlays the NTCSS network connections after the transition to NMCI. The crutch of the issue involving the base network is to allow certain portals to be connected in order to transfer data. In the case of MCAF Kaneohe Bay, the portal of RCP 514 was highlighted as one that would require the X-COI solution.

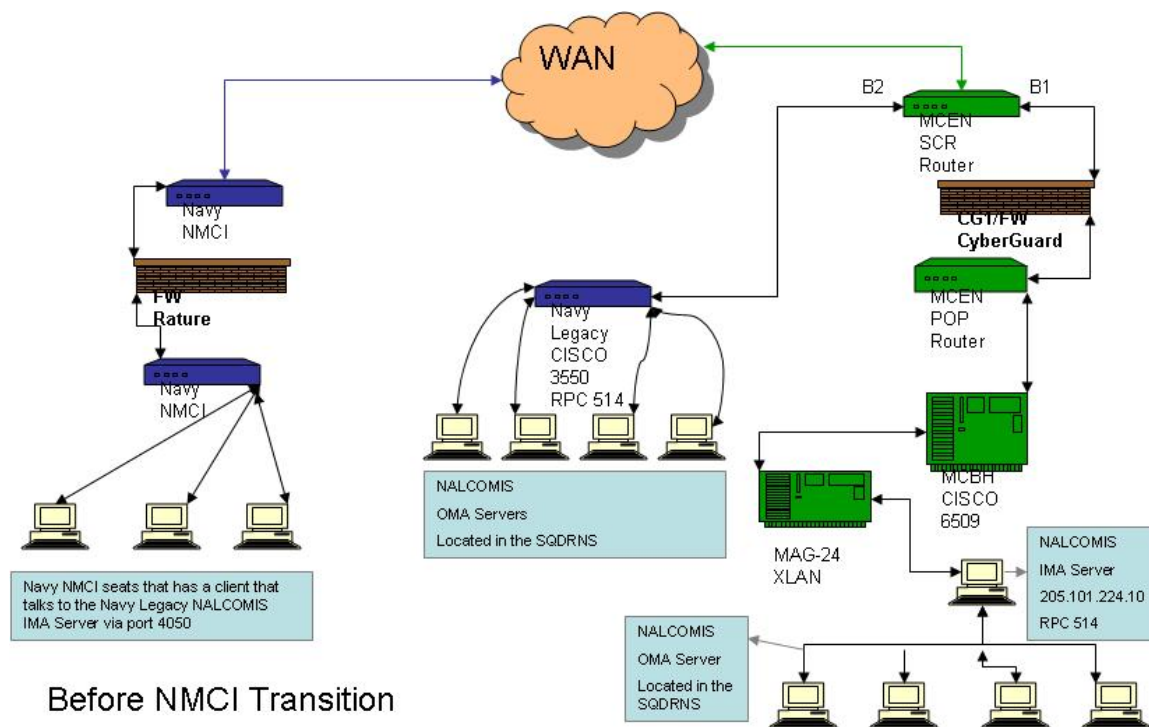


Figure 11. NTCSS Network Configuration Pre NMCI Transition<sup>17</sup>

<sup>17</sup> Figure 11 is from an APOC Assessment Brief.



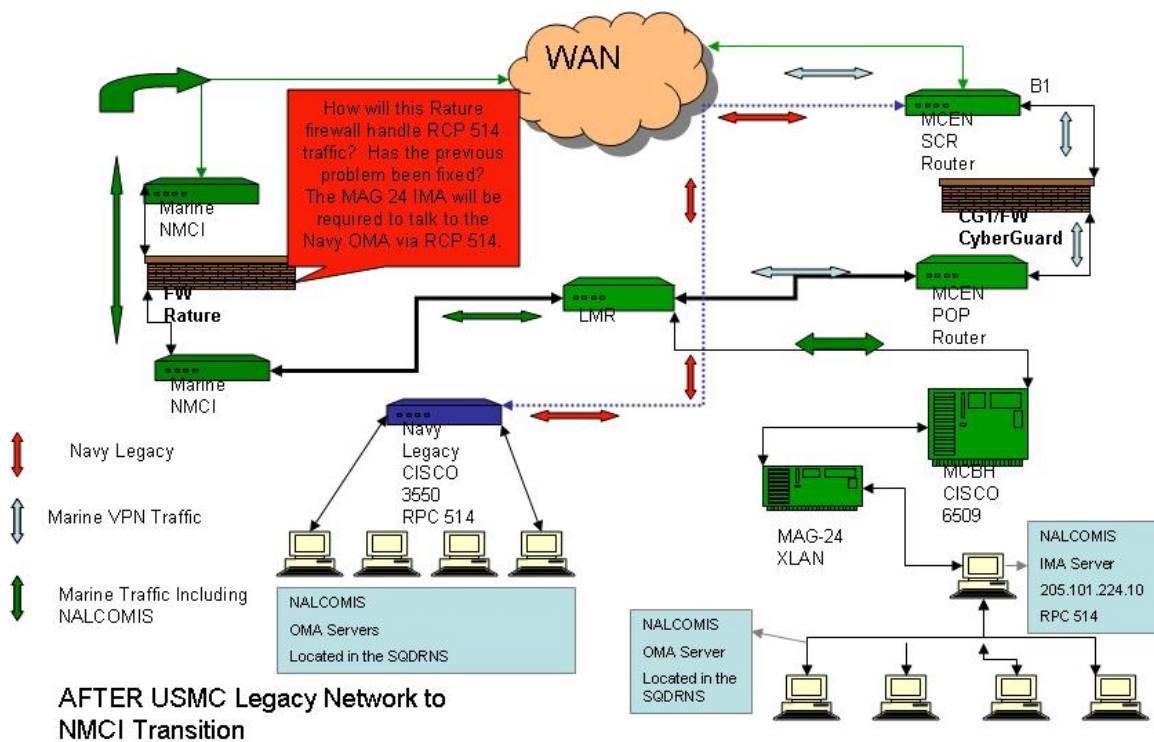


Figure 13. NTCSS Network Configuration Post NMCI Transition Issues<sup>19</sup>

Figure 13 highlights the issue of the RCP 514 protocol after Marine aviation transition into NMCI. In order for Navy's aviation servers to connect to MALS-24 NTCSS servers, they must go out of the Navy's NMCI COI and into the Marine Corps' NMCI COI to reach the NTCSS servers. This is the issue of why the Marine Corps C4 DAA was reluctant to allow any cross connections between the Marine Corps and the Navy's NMCI networks. With the architecture network at MCAF Kaneohe Bay being upgraded to meet SLAs, the APOC TIWG worked at the X-COI issue to ensure it would not stop Marine aviation from transitioning into NMCI.

<sup>19</sup> Figure 13 is from an APOC Assessment Brief.

## **2. Aviation Software Applications**

The results from the pre-assessment conducted in January 2005 at Camp Pendleton, The Marine aviation FAM established the requirement of standardizing all Marine aviation maintenance applications. The FAM for Marine Corps aviation maintenance applications tasked the ALD Chiefs from each of the four Marine Air Wings to prioritize their lists of applications and to consolidate the applications into one list that could be a standardized for all Marine aviation units. The first step was to determine what each MAW was using at each of their respective air bases. The initial list contained over one hundred applications. A large part of this list contained the same application with different versions. SPAWAR PMW-150 as the custodian of all Naval and Marine aviation applications was also instrumental in collaborating with the Marine aviation FAM to consolidate the Marine aviation maintenance software list. PMW-150 updates and test upgrades to the NTCSS suite as necessary but does not set precedence on which version an air wing utilizes. PMW-150 does not conduct NTCSS application upgrades compatibility on NMCI networks. As noted before, the Navy Air Forces have their NTCSS servers on the B2 network, which is not the NMCI network proper. The different applications could be equated to having Windows 2000 and one unit upgrades to Windows XP. The unit is compliant but has functionality is limited to Win2000. This resulted in the aviation template being created in Integrated Solutions Framework Tools and would be used as the template for all of the Marine aviation seats. The USMC aviation maintenance standardized software applications are listed in the USMC aviation template is in appendix E.

The creation of a standardized template is attributed to the leadership of the HQMC's AIS chief and the Marine Corps four MAWs ALD chiefs who took it upon themselves to ensure that all Marine aviation commands would have the same aviation maintenance applications enterprise wide. The group was able to push this issue through in a relatively short time period because they were the leadership for Marine aviation maintenance technology.

### **3. Seat Transition**

The transitioning of a site is the first step toward the overall goal of seat transition. All Marine Corps installations and units must go through the Execution Discipline process in order to identify issues to transition efficiently. The pressure to get all seats in the Marine Corps transitioned over to NMCI had created the need to get all Marine Corps aviation units prepared to transition as soon as they are ready in accordance with Execution Discipline. The desired process of conducting the OT and then implementing those results into further seat transitions had been negated due to the long periods of non-transition periods. The DRPM has directed that the Marine Corps try to complete transition by the end of calendar year 2006. The seat focus for the first transitions at MCB Hawaii concentrated on the APOC test computers.

The APOC TIWG, Base Ops MCB Hawaii, CTRs at Hawaii, and EDS met weekly to identify any problems in preparing MAG-24 for transition into NMCI. The APOC test was to be the frontrunner for the rest of the MAG-24 and Marine Corps aviation to transition to NMCI. Although the test was supposed to run for approximately one month, the rest of MAG-24 units were to continue to transition seats at the rate of 125 per week. The APOC TIWG had worked to ensure that the standardization of seats, software, and network connectivity were the same across Marine Corps aviation sites to allow CTRs to go by a set of business rules to simplify the ordering process. The first component that the APOC TIWG agreed upon was the hardware configuration for Marine aviation. This was actually a Marine aviation decision due to funding and deployability of the seats. The only alternative hardware available at that time was the Dolch ruggedized laptop, which was not given consideration by the APOC TIWG due to its high price and unreliability. Since virtually all Marine Corps aviation units deploy, the decision to make all of the hardware to be the same deployable CLIN was a logical decision. Since all machines were to be deployable CLINs, the issue was to determine what would be the best hardware CLIN for the best price. It was decided that the CLIN 4AC was suitable for Marine Corps deployed units in that it provided the basic hardware and software to support a deployed Marine Corps unit at the best cost. The other concern was to ensure that the Marine aviation seats were accurately ordered through the

enterprise management program. This would include the proper user, software applications, unit, billing, and delivery. The NMCI enterprise tool to the central data repository is outlined in the following to figures.

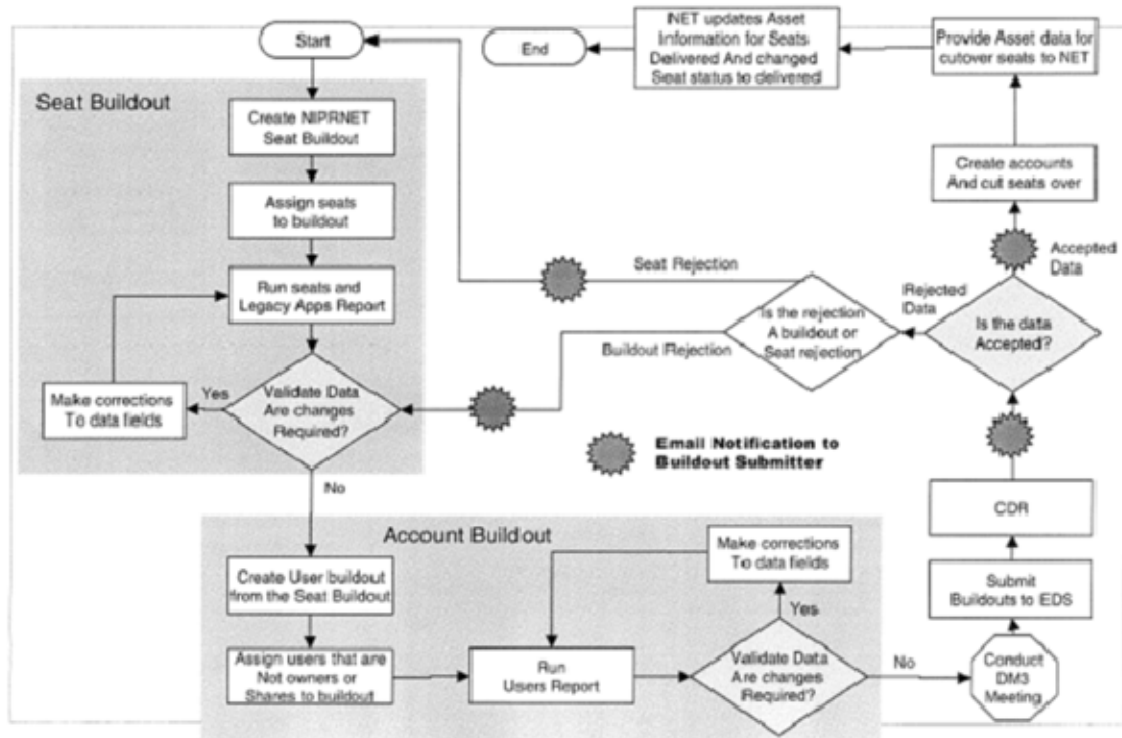


Figure 14. NET to CDR Overall Process Flow<sup>20</sup>

The transition of the APOC computers was accomplished in accordance with ED. The first forty seats to be transitioned for MAG-24 were identified as the APOC user's seats in order to fulfill the 30-day stabilization test requirement. This order was given a higher priority by NMCI in order to meet the 30-day stabilization window.

The Marine aviation seat transition risk and mitigation matrix is very similar to the overall Marine aviation seat transition issues. The only notable difference is that the CLIN 27 legacy server issue was replaced with the DP-17 van pad issue. It was reasoned that if the DP-17 van pads could not be connected through either legacy or NMCI then the risk would be too great since the majority of MALS computers were located in DP-17 van pads.

<sup>20</sup> Figure 14 is from PM USMC NMCI brief of Ordering NMCI Products from January 2005.



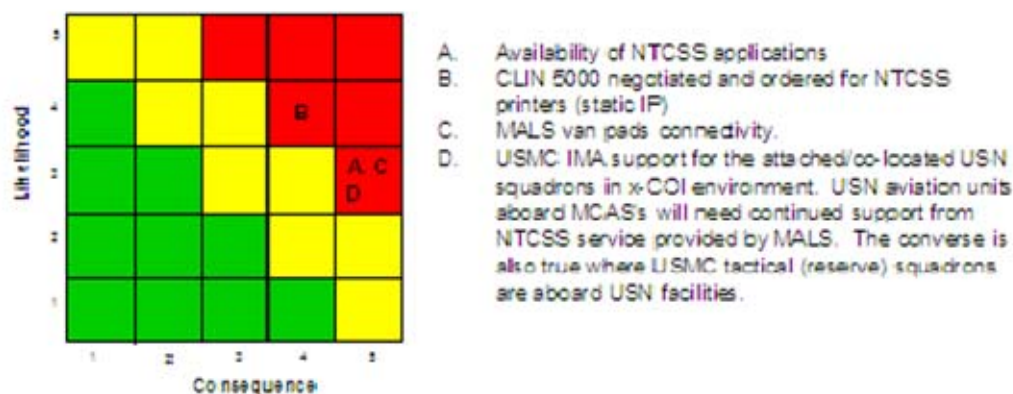


Figure 15. Marine Aviation Seat Transition Risk Matrix Post APOC DT<sup>21</sup>

#### 4. DP-17 Van Pad Operations

The DT conducted at Camp Pendleton presented the problem of how the DP-17 van pads would be connected to the NMCI network. During the time following the DT, EDS network engineers, SPAWAR PMW-150 SMEs, and Marine Corps ALD SMEs tackled the issue of how to support the DP-17 van pads used by Marine aviation. The first issue was to determine what and whose responsibility for connecting and supporting the DP-17 van pads to the NMCI network would be. It was agreed upon that all of the wiring inside the DP-17 belong to the Marine Corps. NMCI would provide NMCI computers and printers according to the NMCI contract. This issue was argumentative due to determining what constituted a building. NMCI requirements where only to provide computers to structured buildings vice the temporary DP-17 van pad structures. The issue was concluded in that the DP-17 van pads where structures because they were in place before the NMCI contract and had computer assets associated with them. However, since they were mobile the government owned the wiring inside the DP-17 van pad.

A meeting was held with EDS engineers, Marine Cops ALD SMEs, PMW-150 SMEs, and the APOC TWIG to determine problem of connecting the DP-17 van pads and to propose solution/s to solve the issue. After Marine Corps ALD explained the

<sup>21</sup> Figure 15 is from the APOC Risk Analysis Brief.

process and procedures of how NALCOMIS works and where the DP-17 van pads fit in the scheme, a resolution was created that would use a pedestal for NMCI network connectivity to the DP-17 van pads. The diagram below was created and used for the DP-17 van pad agreement. The DP-17 van pad agreement is outlined in Appendix F.

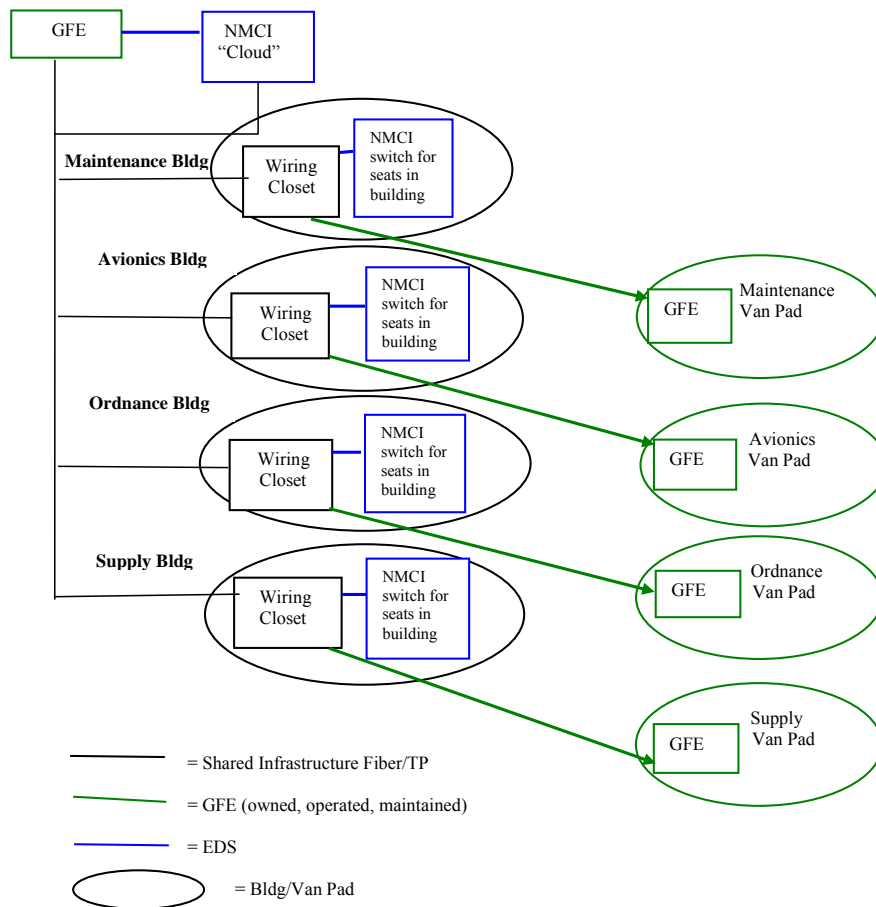


Figure 16. NMCI / USMC DP-17 Van pad Agreement Schematic<sup>22</sup>

The DP-17 van pad issue was the easiest problem to resolve once the problem was identified to all parties. Figure 12 was the schematic drawn out during the collaboration meeting to solve the DP-17 van pad issue.

<sup>22</sup> Figure 16 is from the NMCI/EDS Van Pad solution document.

## **5. NTCSS Printers**

In accessing the requirements for a successful transition of Marine aviation assets over to NMCI, it was determined that—in order for NTCSS printers to function on the NMCI network—NTCSS printers required a static IP address and a connection to the NTCSS server. The NTCSS server hosts the printer queue for NTCSS print jobs. This was one of the discovery items found during the aviation pre- assessment. In researching alternatives, it was determined that NTCSS Legacy OMA print jobs would not clear from the print spool on an NMCI printer. LOMA substantiates the largest part of the Marine aviation applications. All of the other Marine aviation applications were capable of printing to NMCI printers. During the October 2005 Science, Technology, Engineering, and Architecture Group conference, it was discovered that there was a fix for clearing the LOMA print jobs from the NMCI printer queues. The issue then became to determine whether all NTCSS applications would be capable of utilizing NMCI printers.

The NTCSS printers still required a solution in order for the NTCSS printers to have a static IP and connectivity with the NTCSS print server for the APOC. MCSC and EDS had been in negotiations about what services were being used by the NTCSS printers so that the correct CLIN could be placed in eMp. EDS suggested in February 2005 that a CLIN 5000 be created so that EDS could engineer and implement a solution for a one-time price. MCSC analyzed the proposal and other alternatives and then created a request in the NMCI Request Action Program. A CLIN 5000 was created for a proposal on the establishment of static IP addresses and connectivity between wall ports and NTCSS printers.

Another factor that confused the NTCSS printer issue was that the Navy Air Forces purchased CLIN 6AB wall port connections for their NTCSS printers. The Navy Air Forces even purchased NMCI printers in place of connecting their NTCSS printers in garrison. The issue of whether NMCI was responsible for connecting the legacy NTCSS printers to the NMCI network was controversial in several aspects. Marine aviation's viewpoint was that the printers were connected to the MCEN before NMCI and were still utilized heavily because the NMCI printers were not compatible with the NTCSS print server. NMCI's view was that the added NTCSS printers added a burden of network

connections and bandwidth to the NMCI network. From these conferences and discussions, a new set of requirements for NTCSS printer utilization was formed.

Requirement – Determine the NTCSS printing requirements for Marine aviation and logistics units.

Speculation – The current NMCI printing solution does not support the printing requirements of Marine aviation squadrons and aviation logistics squadrons.

From these rudimentary requirements and observations, three courses of actions were formed to determine the best method to move the project forward.

Option 1 – Create a new CLIN that uses existing connections where NTCSS printers are already in place. This CLIN would represent a fair price for providing a static IP address and a low bandwidth connection between the NTCSS print server and the NTCSS printer. No other NMCI services are required.

Option 2 – Modify the existing CLIN 6AK to enable the low-bandwidth connection to a wall plug. This would also include a CLIN 6AH for a static IP address.

Option 3 – Purchase the CLIN 6AB for NTCSS printers.

NMCI was also creating a new CLIN, CLIN 6AR, which dealt with Program of Record devices. The CLIN 6AR is essentially a CLIN 6AB with a connection fee. The procuring contract officer had approved the creation of the new CLIN 6AR. However, it would take it a few months to get through all of the approvals before it was included in the contract modifications.

The risk of moving forward with the APOC test in spite of a NTCSS printer solution was high on the factor of not coming to a solution but would not keep the schedule from moving forward as the NTCSS printers could still be connected through the legacy network.

## **6. Cross Community of Interest (X-COI)**

The X-COI issue became visible when the Naval Air Forces began transitioning their NTCCS system over to NMCI where Marine aviation units and Navy Air Force units shared the same MALS or Navy Aircraft Intermittent Maintenance Department. In

order to facilitate the Naval Air Force's transition at aviation-shared sites, an interim solution was put in place that allowed inbound RCP traffic from the USN COI into the USMC COI. This solution was designed to be temporary in nature due to the vulnerabilities associated with this service. This solution was still in place when the APOC took place.

In order for Marine aviation to transition at every site NMCI would have to engineer, implement and manage an X-COI connection between the USMC and USN VPNs at the shared site transport boundaries where one was required. The connection must ensure that only required ports and protocols are allowed to specific IPs.

The requirements set by SPAWAR System Center Norfolk, which would allow the NTCCS print servers to function on the NMCI network to the NTCSS printers, are listed below:

- A. Each NTCSS I-LEVEL implementation requires the ability to print using LPR TCP 515 from either the HP (HPUX 10/20) or Sun (Solaris 7/8) suite.
- B. Maintain the OMA-IMA Interface, a bi-directional communication path, for aviation squadrons to order parts and perform status queries from their supporting AIMD or MALS NALCOMIS server. The OMA-IMA interface utilizes different TCP ports to perform data transfers depending on the hardware/software configuration for a particular squadron and its supporting I-LEVEL host.
  - a. The three supported OMA-IMA configurations are:
    - 1. LOMA to LIMA Configuration: TCP 23 (telnet)
    - 2. LOMA to OIMA Configuration: TCP 514 (RCP – remote copy)
    - 3. OOMA to OIMA Configuration: TCP 4050, 4100 (Sybase to Sybase) OOMA Client to OIMA: TCP 9132, 9142, and 4050
- C. Provide communication ports for OOMA clients to access OIMA when both the squadrons and I-LEVEL are optimized. TCP ports 9132, 9142 (subset of the NTCSS desktop) and 4050 (Sybase database) allow the OOMA client to authenticate to one of the two NTCSS servers and login to the NALC server to perform status queries. This connectivity will only be allowed via specific designated hosts.

# NTCSS OMA – IMA Interface Configurations

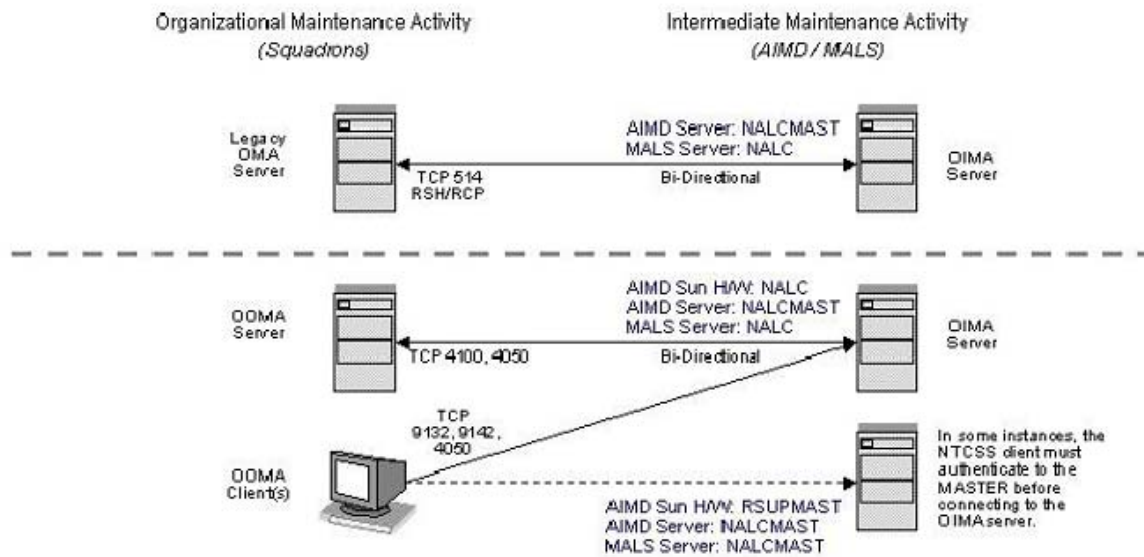


Figure 17. OMA - IMA Interface Configurations<sup>23</sup>

The majority of the Marine aviation units requiring an X-COI solution were located on either a Naval Air Station or a Joint Reserve Base. The sites identified requiring an X-COI are listed below.

- MCAF Kaneohe Bay, HI
- MCAS Beaufort, SC
- JRB/NAS Ft. Worth, TX
- NAS Norfolk, VA
- NAS Atlanta, GA
- JRB/NAS New Orleans, LA
- NAS Willow Grove, PA
- NAF Washington/Andrews AFB, MD

<sup>23</sup> Figure 17 is from NTCSS/NMCI Communication Infrastructure Requirements v1.5.

The risk factor of proceeding with the APOC was considered low enough despite the fact that there was still not an X-COI solution. Since there was a temporary solution in place, it was agreed upon by the APOC TIWG that the APOC should move forward.

## **B. TEST—AVIATION PROOF OF CONCEPT**

The APOC TWIG had tried to resolve the critical milestones to meet the project plan for the APOC. The APOC TIWG laid out the completion dates for the critical milestones in order for the APOC to be conducted. The list of the critical milestone dates are listed below:

- Marine Aviation Maintenance Applications – 5/16/05 all applications on RAT List
- High Level Design (DP-17 Van Pad) – 5/13/05
- Formal Staffing Contracts between EDS/USMC – 5/13/05
- BIOS – Build out of network architecture – 5/30/05
- LADRA Testing – 6/21/05
- NTCSS printer solution in place by the end of August
- X-COI solution in place by the end of August

The Marine aviation maintenance software applications and LADRA testing were both completed in a timely manner. The DP-17 van pad solution was outlined to be installed during MAG-24's NMCI transition. The X-COI solution, NTCSS printer solution, and formal document signing between NMCI and the government were the critical issues that had not been completed before the APOC was scheduled to start.

The initial concept for the APOC was to perform a full-scale realistic test that would encompass an entire Marine Corps aviation unit. The OT was to include an actual unit departure from the confines of a base infrastructure to accurately test the deployable capability of the NMCI Deployables processes. However, due to the Iraqi war, there was not enough resources to do the tactical deployment as envisioned. Following the delivery of the forty NMCI test computers it vital to ensure that the APOC represented a semblance of Marine aviation.

## **1. Test Criteria**

The test criteria used for the APOC was the same used for the APOC pre-assessment. The test criterions were reviewed again to ensure they were still valid.

## **2. Schedule of Events**

The schedule of the APOC test was categorized into the phases listed below:

- NMCI Deployables training 25-28 Oct
- MCOTEA brief to APOC participates 31 Oct
- Pilot Test 31 Oct – 2 Nov
- Garrison Phase 3–4 Nov
- Composite Phase 7–9 Nov
- Deployment (external) Phase 14–23 Nov
- Reintegration Phase 24–30 Nov
- Breakdown 1–2 Dec

The training and garrison phase would resemble how the NMCI Deployables process works. The composite, deployment, and reintegration phases also constituted what actually occurs in a Marine Corps deployment cycle. The processes were kept true to their concept except they were placed on a compressed schedule.

## **3. Training**

The APOC pre-assessment training was two-fold. Deployables training for the Unit IT Reps, testers, and test controllers was conducted to educate them on the NMCI Deployables process. Test user training was conducted with all users to ensure that data would be properly captured correctly. The final breakdown of APOC testers and data collectors were as follows:

- (30) testers from MALS 24
  - 27 NMCI machines
- (17) testers from HMH 363



- 7 NMCI machines
- 7 Users throughout the APOC (All Four Phases)
- 10 Additional Users will augment the HMH “Det” during the Deployed Phase and will conduct routine maintenance transactions on an actual CH-53D helicopter.
- (15) Data collectors
  - MALS (8)
  - HMH-363 (5)
  - MAG HQ (2)

#### 4. Network Architecture

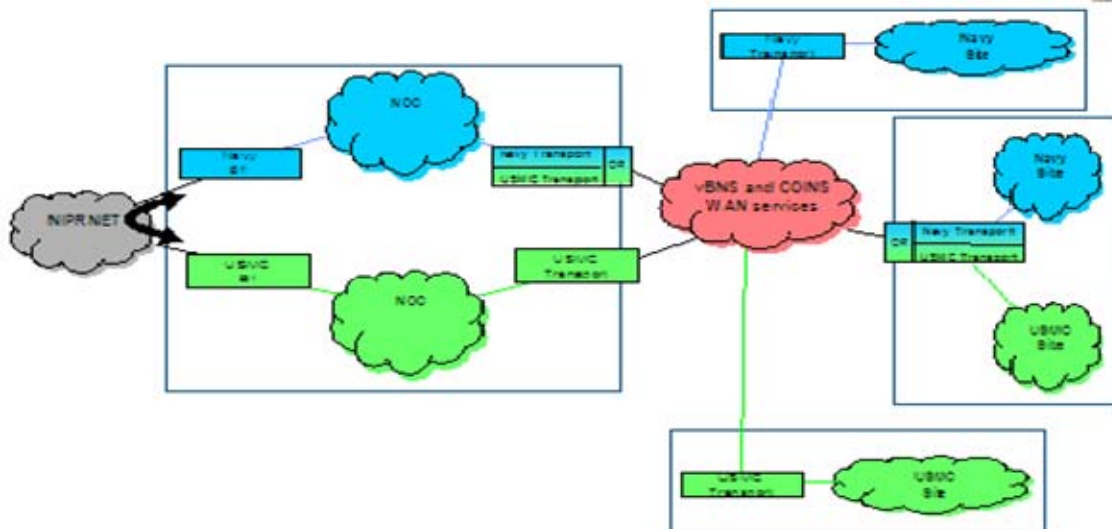


Figure 18. NMCI Network Configuration for MCAF Kaneohe Bay<sup>24</sup>

The test machines were NMCI machines, (CLIN 4AC), that had been transitioned for HMH-363s and MALS 24. The network drops for the garrison phase were the individual users’ actual workstations. The tactical network architecture used by the test machines was designed by MALS 24 AISD, MCOTEA, NMCI, and NetCo personnel to establish a link between the OMA servers located at the Deployed test site and the IMA server located at MALS-24.

<sup>24</sup> Figure 18 is from USMC APOC Awareness Brief. May 2005.

Figure 18 outlines the NMCI network connections for the Marine Corps and Navy COIs on MCAF Kaneohe Bay. Appendix H contains all of the build out diagrams for MCAF Kaneohe Bay. The networking diagrams outline where MAG-24's NMCI computers and printers are to be located. This was part of the Execution Discipline process to which NMCI validates what government IT asset is actually where it is or is not suppose to be. The network architecture for NMCI as a whole had not encountered any major problems until Marine aviation was scheduled to transition. This is due mainly to the large number of IT assets that Marine aviation possesses and to the age of the networks where Marine aviation units are located.

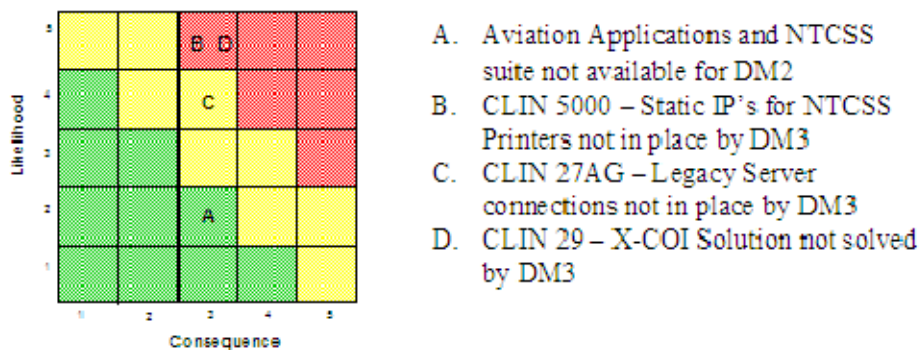


Figure 19. Marine Aviation NMCI Integration Risk and Mitigation Matrix Pre APOC<sup>25</sup>

The NMCI transition team was able to complete the transition of the forty test machines in the prescribed time to allow for the thirty-day stabilization period. The Marine aviation applications had been standardized and placed in DADMS where a template was created for MCAF Kaneohe Bay. The other risks of NTCSS printers, DP-17 van pads, and CLIN 27 legacy server connections were reduced to an acceptable level by either technical or temporary contract solutions. It was concluded by the APOC TIWG that the OT could commence.

<sup>25</sup> Figure 19 taken from APOC Risk and Mitigation Brief.

## 5. Test—Garrison Phase

The office spaces in hanger 101 at MCAF Kaneohe Bay were transitioned by NMCI following the ED process just as they would be for a normal transition. The forty APOC test computers were also identified and transitioned first. Note; the testing computers were not assigned to hanger 101 which was home to HMH-362 who were deployed. The APOC testers predominantly came from MALS-24 and HMH-363. Figure 20 displays the APOC test computers and location.

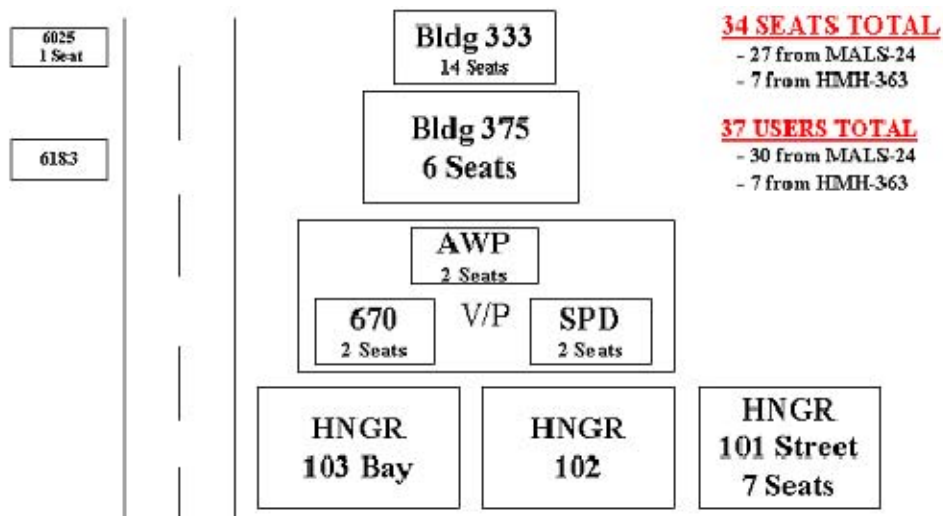


Figure 20. APOC Testers<sup>26</sup>

The garrison phase of the APOC OT followed the users in their day-to-day routine jobs functions. Each user completed a task assigned by MCOTEA to determine whether the Marine aviation maintenance applications functioned properly on the NMCI network. Trouble points were evaluated only to ensure the OT could continue. The test users filled out data sheets each day relating to their assigned tasks. Test controllers collected the data each day to be evaluated after the conclusion of the APOC OT. This procedure would be subscribed to in each phase.

Following the garrison phase, the test users were brought together at the deployed test site to determine that the NMCI network would support the scenario. This was to

<sup>26</sup> Figure 20 taken from APOC Report November 2006.

facilitate the question for the Deployables on whether NMCI could support a composite unit such as an element of a Marine Expeditionary Unit. The network connectivity proved to be a success and the APOC OT prepared for the deployed phase of the test.

## **6. Test—Deployed Phase**

The tactical network was set up using DP-17 van pads in hanger 101 to simulate a tactical environment. The tactical scenario was deemed a simulation since the DP-17 van pads were using base utilities. This still provided separation from other activities, but allowed locality for logistical ease.



Figure 21. DP-17 Van Pads APOC Deployed Test Site<sup>27</sup>

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<sup>27</sup> Figure 21 photograph taken by Major G. R. Hightower.

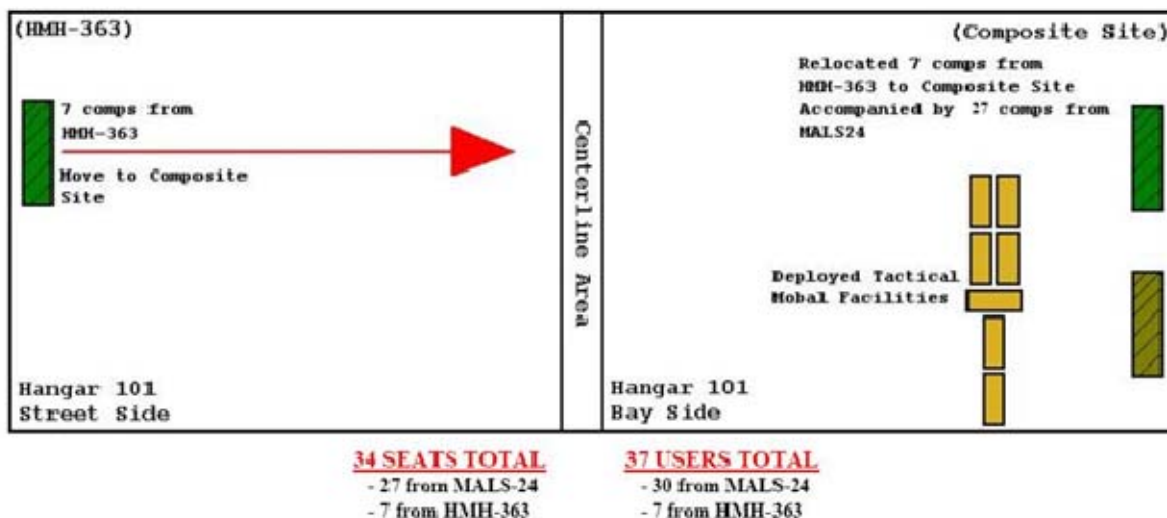


Figure 22. Hangar 101 Deployed Site Diagram<sup>28</sup>

The deployed test site was established as an actual MALS unit would be except for its size. It contained all of the necessary IT requirements to function as a forward deployed MALS/squadron maintenance department. The number of APOC test users for the deployed phase was thirty-seven—thirty from MALS-24 and seven from HMH-363. Twenty-seven NMCI computers were relocated to Hangar 101 for a total of thirty-four APOC test computers.

The APOC test users were once again assigned tasks by MCOTEA just as before in the garrison phase. The key element in the deployed phase was to determine whether Marine aviation maintenance application would function properly after the NMCI computers had completed the NMCI Deployables process. The OT for the deployed phase was conducted and preparations for the reintegration of Marine aviation IT assets back to the NMCI network were initiated. Normally this process has a minimum notification timeframe to allow NMCI the time to prepare for a units return to NMCI. The processed was compressed due to time constraints and resources.

<sup>28</sup> Figure 22 taken from APOC Report November 2006.

## **7. Test—Return to Garrison Phase**

The return to garrison phase followed the NMCI Deployables business rules for returning NMCI Deployable computers back to the NMCI network. The key aspect for this phase of the test was to determine the effect of reconnecting several different configurations of Marine Corps aviation NMCI computers. One would be a Marine aviation NMCI computer in which the configuration had not been changed since it was deployed; one of which unauthorized NMCI software programs had been added; and one where the computer had been re-imaged with the NMCI re-imaging software. The rest of the return to garrison phase was to test the logistic side of the NMCI Deployables.

### **C. POST-TEST—AVIATION PROOF OF CONCEPT**

The post-test results from the APOC OT were collected and analyzed by MCOTEA who would produce a formal report of the test. The initial results were that Marine aviation could operate on the NMCI network without service interruption.

#### **1. Network Architecture**

The NMCI network functioned properly except during a time period when APOC test users were following the steps to properly detach their NMCI computers from the NMCI network. It was initially thought to be the NMCI Deployable application failed but turned out to be a network connectivity issue at MCB Hawaii.

#### **2. Seat Transition**

The NMCI aviation template created by HQMC AVN provided the basis for all USMC aviation maintenance seats. This template included the forty-two Marine aviation maintenance applications, which include the NTCSS suite that is necessary for managing aircraft maintenance actions. The garrison phase of the OT was conducted without any major issues in regards to the aviation maintenance applications. After the deployment and return phase of the OT, it was discovered that out of the forty test seats transitioned for the OT, all had one or more of the Marine aviation maintenance applications missing. After further discussion, it was not conclusive if the missing aviation maintenance applications were ever loaded on the APOC test computers from the NMCI warehouse.

The NMCI ED process has had multiple challenges during the transition period. Accountability of government IT assets was the biggest issue to resolve when transitioning a unit/base. The NMCI ED process sought to validate what was at the site; determine what the unit has ordered; and then correctly enter that all in the database so that the NMCI warehouse could configure the computers for each user correctly. Figure 23 outlines the NMCI process of the CTRs order to delivery process.

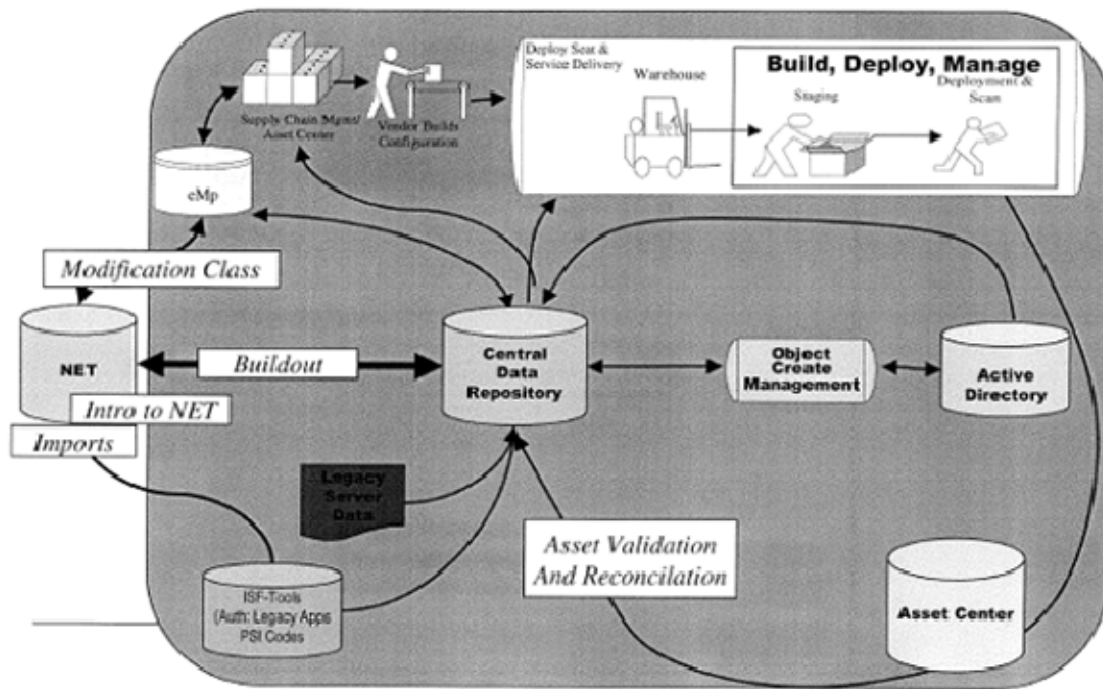


Figure 23 – NMCI Order to Delivery Flow<sup>29</sup>

### 3. Marine Corps Aviation Issues

#### a. Aviation Applications

The aviation template created in DADMS proved to be a proven process in moving the transition of Marine aviation into NMCI. The template allowed Contracting Technical Representatives to streamline their NMCI orders in selecting the Marine aviation template vice making a selection of different applications.

<sup>29</sup> Figure 23 taken from PM USMC NMCI brief of Ordering NMCI Products from January 2005

***b. Static IPs for NTCSS Printers***

The use of NTCSS printers in a garrison environment has been necessary due to the incapability of the NTCSS print server with the NMCI printer. The temporary solution of allowing NTCSS printers to connect to the NMCI network without levying a CLIN against them since there was not a decisive hindrance to the APOC OT.

***c. DP-17 Van Pad Connectivity***

The DP-17 Van Pad connectivity diagram that was agreed upon by HQMC AVN, EDS, and PMW-150 would be used for the tactical portion of the test. While the DP-17 network connectivity diagram is being used throughout the Marine Corps, there was still no official documentation during test.

***d. X-COI***

The X-COI RAP is still under review by EDS. Awarding and engineering the X-COI solution would require considerable time. Therefore, it was not included as part of the APOC test. The temporary connection of specified portals would have to be agreed upon at each base.



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## **V. MARINE AVIATION NTCSS SERVER TRANSITION**

Chapter V covers the Marine Corps Aviation NTCSS server transition from the Marine Corps Enterprise Network to the NMCI network. It describes the CLIN 27 server connections in relation to the NMCI contract. The CLIN 27 AG Legacy Server connection is explained as it pertains to the NTCSS server connections, HQMC C4, and the NMCI contract. Chapter V also describes the CLIN 27 AG issues and solutions related to the NTCSS server transition.

### **A. CLIN 27**

The CLIN 27 server connections were created to account for all of the NIPRNET and SIPRNET server connections for the Navy and the Marine Corps servers on the NMCI network. The servers that had a program of record and placed in the legacy category were predominately planned to connect with the CLIN 27 AG legacy application server connection. The CLIN 27 AG server connections were managed by HQMC C4 and would be given to the Marine Corps IT systems according to priority. HQMC C4 established the process in MARADMIN 308-05 Message DTG 130027Z JUL 05 policy for NMCI CLIN 0127AG selection and approval. NMCI also had requirements for selected server/applications to be placed on the NMCI network. Each application hosted on the server must comply with the following:

- Must have a current IATO/ATO issued by MCNOSC
- Must be identified in DON Application and Database Management System (DADMS) as Functional Area Manager (FAM) "Approved" (FAM "Allowed with Restrictions (AWR)" applications will not be considered))
- Must employ the most current version of the client application operating on NMCI
- Must employ a client application that has been certified and deployed on the NMCI environment

Since NTCSS was a program of record, HQMC Aviation ALD already had the required paperwork in place that would place the NTCSS servers in a high priority for CLIN 27 AG connections.

## **1. CLIN 27 AG**

The original NMC contract included server connectivity for 2100 legacy applications. The contract language was ambiguous and inconsistent with the processes that NMCI used to manage services. PM-NMCI and EDS agreed to an alternative arrangement, which was detailed in Naval Message “PEO IT WASHINGTON DC 221913Z APR 05.”

- This message set the maximum number of 0127AG server connections at 5,000, which was broken out to provide 1,429 server connections for USMC and 3,571 for the USN. This agreement provided some criteria for CLIN 0127AG usage (see business rules) and clarified that the CLIN 0127AG could not be used for DMZ services.

The CLIN 27 AG legacy application server connection was selected as the primary contract vehicle to connect the Marine aviation NTCSS servers to the NMCI network.

The main reason is that the CLIN 27 AG legacy application server connection had a zero dollar cost associated with it. It can be connected to low, medium, or high bandwidth (10MB, 100MB, 1GB) on the NMCI network depending on the base/site infrastructure.

The Marine Corps as a whole received around 1429 of the 5000 available CLIN 27 AG connections allowed for the NMCI network.

The HQMC C4 and the Marine Corps PM NMCI office followed the criteria set by the PEO-NMCI office for both the Navy and Marine Corps. Priority is as follows:

1. DON/DoD mandated
2. Programs of Record (POR)
3. Mission Critical (MC)
4. Mission Essential (ME)
5. Joint (USA/USAF/JTF/DHS)
6. Others (Command/Unit)

Marine aviation NTCSS servers had three of the top four of the CLIN 27 AG criteria. The NTCSS program was run as a program through PMW-150 and was a program of record. It was mission essential to the operational readiness of all Navy and Marine

Corps aviation units. The mission critical status was confusing since it was critical to the Marine Corps aviation units but NMCI used the term for IT systems that must never be inoperative. While NTCSS could not be down for any prolonged period, it was not labeled as mission critical. The three categories that the NTCSS servers did qualify for were enough to allow them to be granted CLIN 27 AG legacy application server connections.

## **2. CLIN 27 AG Orders**

Marine aviation had the necessary priorities in order to be allotted the necessary CLIN 27 AG connections to connect all of the NTCSS servers operated by Marine aviation flying and maintenance squadrons. Each Marine flying squadron has two NTCSS servers and each MALS has four NTCSS servers. The number of total servers after the APOC came to 249. Each CTR at each base/site was required to provide documentation of the DON/DoD mandate when placing your order in NET. After the CLIN 27 AG orders were placed in NET, the CLIN 27 AG transition would begin with decision meeting (DM1).

The CLIN 27 AG transition followed the CLIN 27 transition process with decision meetings one, two, and three. These DMs were established to ensure that NMCI and the Navy and Marine Corps users had met the requirements for the designated servers to be transition in to NMCI.

## **B. CLIN 27 TRANSITION FOR NTCSS SERVERS**

A CLIN 27 working group was formed to facilitate the transition of Navy and Marine Corps servers into the NMCI network. This process followed a plan mimicking the Marine Corps NMCI Program Office's Execution Discipline procedure for transitioning a base/site to NMCI. After a CTR submitted an order for one of the CLIN 27 server connections, decision meetings with all of the stakeholders was held to ensure all of the necessary requirements were met. The CLIN 27 AG legacy server connections were included in the overall CLIN 27 server transition process.

### **1. Base/Site Preparations**

The first requirement for transitioning Marine aviation NTCSS servers over to the NMCI network was for all of the Marine aviation computers at the base/site to be transitioned over to NMCI. The other crucial requirement was for PMW-150 to ensure that the NTCSS server had the required updates and patches to transition into NMCI. The base/site network infrastructure was not an issue since the base/site network had already undergone capacity testing during the computer transition.

### **2. CLIN 27 AG NTCSS Transition Schedule**

The NTCSS server did not have a concrete schedule. This was due to some sites still undergoing seat transition while others were completely transitioned. The schedule for the CLIN 27 AG transition was included in the overall CLIN 27 transition process. In such, the schedule of transition was based on which Navy or Marine Corps base/site had met the CLIN 27 execution discipline process and available NMCI resources.

### **3. CLIN 27 AG NTCSS Transition Issues**

There were no technical issues that halted or delayed the NTCSS transition. The only transition issues were administrative.

## **C. CLIN 27 AG NTCSS TRANSITION RESULTS**

The CLIN 27 AG transition was a success to get all of the Marine Corps aviation NTCSS servers into NMCI. The plans and procedures used by the CLIN 27 working group outlined the issues and resolved them in a timely manner to ensure the successful transition.

## **VI. SUMMARY AND CONCLUSIONS**

Chapter VI summarizes the Marine Corps Aviation Proof of Concept and the transition of Marine aviation IT assets into NMCI. It highlights the four issues discovered during the APOC DT and their current status. The NMCI contract will be re-competed in 2010 under the project called the Next Generation Enterprise Network. The chapter concludes with examining future research in supporting the Marine aviation NTCSS network environment.

### **A. SUMMARY AND CONCLUSION OF THE APOC**

The NMCI network became a reality after the contract was signed on 6 October 2000. Many Navy and Marine Corps communities resisted the change while some welcomed it. The NMCI contract was written in record time despite the millions of dollars being committed by the DON. The five-year history of the DON conversion over to NMCI has encountered almost every possible obstacle and issue imaginable. Despite these valuable lessons learned, the MCSC NMCI PM office faced many difficulties to effectively transitioning Marine Corps IT assets over to NMCI.

The standards and configuration management that was used to transition USMC aviation over to NMCI helped to baseline all of the hardware, software, and other periphery equipment used by all of Marine Corps aviation enterprise wide. The effort to get all units on the same level with all other units enhanced the compatibility across all USMC units.

NMCI did level the playing field between the units who had sufficient IT assets and those who did not. The general accountability for IT assets had not been held to the accountability standards that some other IT systems had. The bulk of Marine aviation's computers were NTCSS computers that were supplied by NTCSS program of record managed by PMW-150. These IT assets were included in the overall Navy/Marine Corps NMCI program, which merged the Marine Corps aviation IT requirements into the overall program. The APOC was conducted for multiple issues related to the services contracted by NMCI. Marine aviation had delayed transition into NMCI when it was

observed that the transition process interrupted IT services. Marine aviation is dependent on IT services to provide functionality to its NTCSS aviation software applications, which are required to enable Marine aviation units to maintain operational readiness.

Marine aviation had a great stake in ensuring the transition of Marine aviation NTCSS was functional and supportable in the NMCI environment. The requirements for the transition and operation of Marine aviation NTCSS systems determined by the APOC TIWG to ensure the transition of Marine aviation into NMCI would enable Marine aviation to maintain operational readiness during a time when aircraft readiness was essential. Members of the APOC TIWG also had the goal of creating the template for transitioning all of Marine aviation into NMCI in order to meet contractual agreements.

The APOC TIWG was formed with the stakeholders who were involved in every aspect of Marine aviation IT maintenance support. The APOC TIWG worked diligently to identify operational requirements and potential setbacks in the Marine aviation transition into NMCI. The APOC DT identified the potential issues and a project plan was put into place to reduce the risk of those issues. The result of addressing these issues and standardizing the solutions not only brought Marine Corps aviation closer to standard NTCSS applications amongst all of the Marine Corps aviation units but also helped standardized the commonality between the Marine Corps and Naval aviation NTCSS applications.

The APOC OT proved that Marine Corps aviation could function on the NMCI network without any interruption of services, particularly the NTCSS suite of aviation maintenance applications. The standardization of Marine Corps aviation maintenance applications was a tremendous step forward in making the Marine aviation transition to NMCI a success. This also reduced the workload of trying to keep several obsolete software applications in the DADMS database. The APOC TIWG had brought the risk of the main issues of the APOC DT down to an acceptable level or provided a temporary alternative solution for the OT to be executed. The APOC provided a framework for Marine aviation and NMCI to transition all of Marine aviation over to NMCI.

## **B. MARINE AVIATION TRANSITION ISSUES INTO NMCI**

The issues identified during the APOC DT have either been resolved or a temporary solution put in place. The four issues help ensured a smooth transition of Marine aviation assets into NMCI and set the stage for standardization.

### **1. Marine Aviation Seat Transition**

The APOC DT identified several issues and processes to whether Marine aviation was capable of transitioning and operating on the NMCI network without diminishing operational readiness. These issues were addressed by the APOC TIWG to mitigate the risk to acceptable levels in order to proceed with the APOC OT and the eventual transition of all Marine Corps aviation into NMCI. The seat transition was the basis of all NMCI transitions of Navy and Marine Corps sites/bases. The ED process sought to identify what IT assets and services were present at these sites/bases and configure them to meet the SLAs of the NMCI contract.

A large percentage of the IT assets operated by Marine aviation units were from the NTCSS program of record and thus had a higher accountability than other Marine Corps units. HQMC Aviation made the decision that all Marine aviation flying squadrons would have 90 computers. The number of computers each MALS unit was determined on the number of personnel in the unit and how many squadrons the MALS supported. This was necessary in order to place the orders in NET and start the transition process. The next issue was to map software applications to the individual seat. This is where the APOC started to answer what the requirements were for Marine aviation for NMCI.

#### ***a. Aviation Applications***

The Marine aviation maintenance applications template created for the APOC OT proved to be the basic template to be used throughout the Marine aviation transition. The standard NTCSS applications used by all Marine aviation units were the initial forty-two NTCSS applications identified after the aviation pre-assessment in January 2005. The Marine Corps aviation template was used to configure the computers



used for the APOC. The template enabled CTRs to place orders for software applications with one click vice having the customer choose what software applications they required.

The basic template had to be expanded upon when the NMCI transition went to other Marine Corps bases/sites. Each base/site could only LADRA test the software applications that were used on that base/site's COI. Thus, all of the aviation maintenance software applications that dealt with a specific aircraft type would only be available at those base/sites that tenanted that particular aircraft. For example, the rotor and balance software program for the AH-1W helicopter would only be available sites such as Camp Pendleton's MCAF, MCAS New River, and NAS Atlanta, where AH-1W helicopters were stationed. Thus, CTRs created an aviation template for their respective bases/sites, which would have all of the Marine Corps NTCSS applications on the COI for that base/site.

#### ***b. NTCSS Printers***

The NTCSS printer solution was one that was more of a contracting issue than of technology. The issue identified in the DT found that the NTCSS print servers could not print to the NMCI printers. The other issue was the quantity of printers allowed for a Marine Corps aviation unit. After years of negotiating, the issue finally found a solution.

The solution was to allow Marine aviation units to connect their NTCSS printers to the NMCI network at no charge. The stipulation was that there would be a one-time connection at no charge for when the unit transitioned to NMCI. The Marine aviation units that had already transitioned were simply allowed to continue as they already had the NTCSS printers connected to the legacy network.

## **2. DP-17 Van Pad**

The DP-17 van pad initially presented itself as the easiest problem to resolve. While this was true technology, it was not true in getting the agreement signed by all the stakeholders involved. The initial agreement to connect the Marine Corps aviation DP-

17 van pads was never signed by NMCI officials. Although the DP-17 was not an official agreement, it was used during the Marine Corps aviation transition.

### 3. X-COI

The X-COI issue was solved with Navy and Marine Corps aviation units that require network connectivity. The Marine Corps DAA allowed the necessary portals to be opened to either the MALS unit or Navy AIMD that provided the aviation logistic support for that base/station. A formal solution was finally drafted and acted upon. USMC-5000-2007-3941 was an addendum to the Cross COI solution to provide required services not previously addressed by the STEAG. This allowed Marine aviation users to utilize naval aviation resources and vice versa, support NALCOMIS and Marine aviation units, and support requirements to host Marine aviation seats on the Navy NMCI COI.

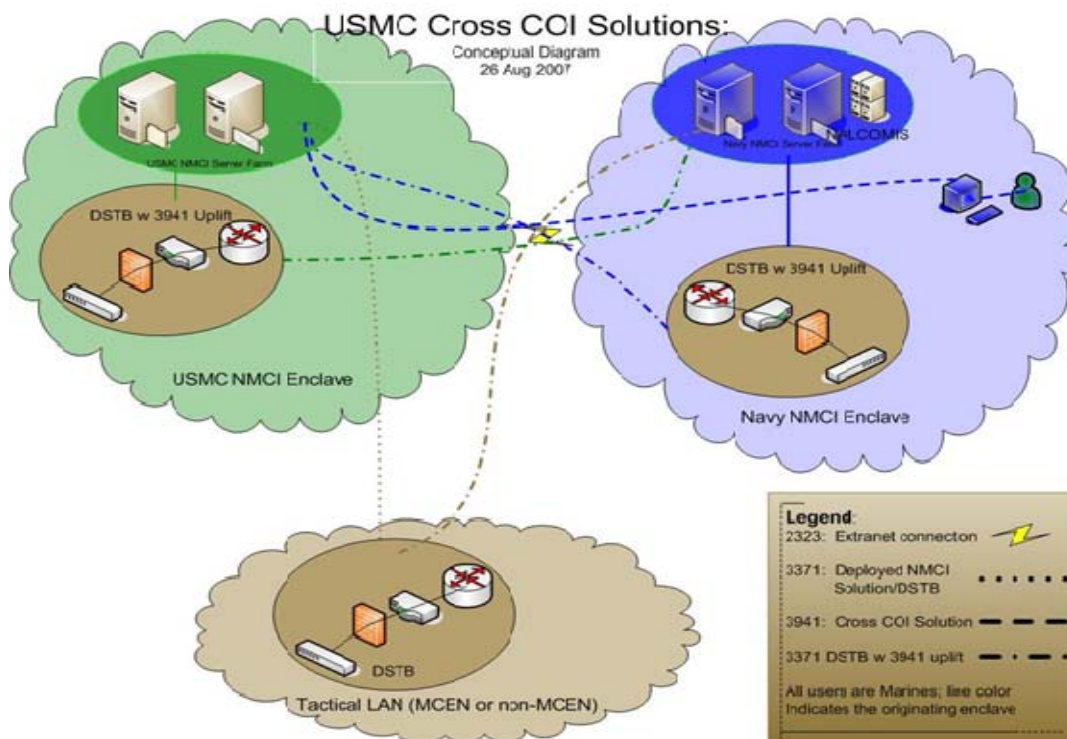


Figure 23. Proposed USMC Cross COI Solution<sup>30</sup>

<sup>30</sup> Figure 23 taken from General Topic Update Brief to HQMC, C4. September 2007.

The stipulations of the X-COI agreement are as follows:

- Creates a one-way trust between USMC NMCI and USN NMCI (upon DAA approvals)
  - USMC users may log into USN NMCI seats
  - USMC users may access USN CLIN 27 servers (i.e., NALCOMIS) via Deployable Site Transport Boundary (DSTB)
  - Deployed users may reach back into the local Navy or USMC COI via DSTB
- Provides option for a garrison version of the DSTB
  - Approx. 200 port switch
  - Intended to allow users to access Navy & USMC NMCI resources from the other enclave (upon ODAA approvals)
  - NALCOMIS users will be able to access Navy CLIN 27 servers & USMC e-mail, S drives, etc from the USMC NMCI enclave
  - VUSMC users will be able to use a Navy NMCI network to access USMC NMCI services

The X-COI was one of the obstacles in making the NMCI network a true intranet. Many complaints were voiced when Navy and Marine Corps units located on the same base no longer used the same network, thus, they actually needed two networks on a base. Network security was and still is the major factor in the X-COI issue.

#### **4. Marine Aviation NTCSS Servers**

The transition of the Marine Corps NTCSS servers to NMCI was a successful project. The transition followed the execution discipline process and completed the Marine Corps NTCSS transition according to the project timeline.

### **C. CURRENT STATUS AND NEXT GENERATION ENTERPRISE NETWORK**

The Navy's Program Executive Office for Information Systems (PEO-IS) and HQMC C4, along with MCSC's PM NMCI, have begun the requirements phase for re-competing the current NMCI contract. The follow-on Navy and Marine Corps network called the Next Generation Enterprise Network (NGEN) will replace NMCI. The goal of NGEN is to take NMCI to the next level. It will eliminate the negative features of NMCI and take the positive aspects of NMCI forward to form an intranet.

## **1. Current Status of Marine Aviation and NMCI**

The use of NMCI CLIN 4AC Deployable computers is different depending on where the Marine organization is operating. Marine Forces Central Command has forbid the use of NMCI computers to Operation Iraqi Freedom (OIF) theater since 2007. West coast Marine aviation units still use NMCI deployable computers for shipboard deployments and while conducting military exercises. Many of the east coast aviation units have traded their NMCI laptop computers for NMCI desktop computers. HQMC C4 has purchased laptops for deployment use through the Marine Corps Hardware Suite (MCHS) program. The NMCI contract expires on 31 September 2010. Navy CIO Robert Carey predicts that it will take until 2012 to transition to NGEN.

## **2. The Future of Marine Aviation and NGEN**

The use of an outside contract vendor will continue when the NGEN contract is awarded. The main difference is that not all IT assets will be controlled by the vendor. The government and/or military must retain control at certain levels in order to adapt to changing requirements and resources. Outsourcing IT services while in garrison has proved beneficial. However, the use of said same IT services has not proved successful for deployed Marine Corps forces with NMCI. The flexibility to adapt to joint and sister service networks was hampered by the use of NMCI deployable computers. The dismal logistical support provided by NMCI to deployed forces hampered IT readiness levels.

## **D. FUTURE RESEARCH**

The APOC proved that NMCI and Marine aviation maintenance applications could function together. The other part of the APOC was to evaluate the logistical side of NMCI in support of NMCI Deployable computers. The APOC used the OT as the test bed to determine whether NMCI Deployable support was effective for Marine Corps units. The APOC was not a good determinant for the logistical support from NMCI because the base was still undergoing transition to NMCI. Also, the test was not accurate since it was influenced by the PEO-NMCI and NMCI executive bodies to conduct the test when the base was not ready to support NMCI Deployable computers logistically. The

NMCI Deployables Group conducted a Lean Six Sigma project after the APOC to identify the support required for a deployed unit. This included but was not limited to extra computers, software, and hard drives. Many other issues were improved in the NMCI Deployable support but it finally came to HQMC C4 purchasing non-NMCI computer to support the deployed forces in global war on terror. Thus, Marine aviation NMCI computers were mostly left in garrison while units deployed. It would be beneficial to Marine aviation and the Marine Corps to determine what the requirements are for a deployed support package. The support for deployed Marine forces should be for two distinct phases. The first was for the initial incursion where follow on support was not available. An IT support package should be capable of supporting a designated unit for a set time period. The second phase would be after initial hostilities had ended and the logistical chain had been established.

The other area of interest is how the Marine Corps aviation will function globally. Currently, units take their NTCSS servers or data and work from stand-alone systems that periodically connect to the NTCSS network. As the NMCI contract will end in 2010, Marine aviation should develop requirements for IT support for the NTCSS network, to be used whether in garrison or deployed, without interruption of service.

## LIST OF REFERENCES

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- “Order to Delivery and Service Request Management For Applications: NMCI Quarterly Conference. 24 June 2004.

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“United State Marine Corps Independent Assessment Report for the Aviation Proof of Concept of the Navy/Marine Corps Intranet.” November 2005. Marine Corps Operational Test and Evaluation Activity, Quantico, VA.

“USMC APOC Awareness Brief. May 2005. APOC TIWG.

## APPENDICES

### A. SERVICE LEVEL AGREEMENTS

**SERVICE NAME: END-USER PROBLEM RESOLUTION**

**SLA: 101**

*Performance Category: End User Problem Resolution*

*Increment 1 SLAPC: 101*

**SERVICE NAME: NETWORK PROBLEM RESOLUTION**

**SLA: 102**

*Performance Category: Network Problem Resolution*

*Increment 1 SLAPC: 102*

**SERVICE NAME: END-USER SERVICES**

**SLA: 103**

*Performance Category: E-mail Services - User E-mail Availability*

*Increment 2 SLAPC: 103.1.1*

*Performance Category: E-mail Services - E-Mail End-to-End (Client-Server-Server-Client Performance)*

*Increment 2 SLAPC: 103.1.2*

*Performance Category: E-mail Services - E-Mail Server Service Availability*

*Increment 1 SLAPC: 103.1.3*

*Performance Category: E-mail Services - E-mail Client Responsiveness*

*Increment 2 SLAPC: 103.1.4*

*Performance Category: Web and Portal Services*

*Increment 2 SLAPC: 103.2*

*Performance Category: File Share Services – Server Availability*

*Increment 1 SLAPC: 103.3.1*



*Performance Category: File Share Services – Client Responsiveness*

*Increment 1 SLAPC: 103.3.2*

*Performance Category: Print Services*

*Increment 1 SLAPC: 103.4*

*Performance Category: Network PKI Logon Services*

*Increment 1 SLAPC: 103.5*

*Performance Category: Problem Resolution for Access to Government Applications Increment 1 SLAPC: 103.6*

*Performance Category: RAS Services – Service Availability*

*Increment 1 SLAPC: 103.7.1*

*Performance Category: RAS Services – Client Responsiveness*

*Increment 1 SLAPC: 103.7.2*

*Performance Category: Blackberry Services*

*Increment 1 SLAPC: 103.8*

**SERVICE NAME: HELP DESK**

**SLA: 104**

*Performance Category: Average Speed of Answer - Telephone Calls*

*Increment 1 SLAPC: 104.1.1*

*Performance Category: Average Speed of Response – Voice Mail/E-mail*

*Increment 2 SLAPC: 104.1.2*

*Performance Category: Call Abandonment Rate*

*Increment 1 SLAPC: 104.2*

*Performance Category: First Call Resolution*

*Increment 1 SLAPC: 104.3*

**SERVICE NAME: MOVE, ADD, CHANGE**

**SLA: 105**

*Performance Category: Move, Add, Change*

*Increment 1 SLAPC: 105*

**SERVICE NAME: INFORMATION ASSURANCE SERVICES**

**SLA: 106**

*Performance Category: Security Event Detection*

*Increment 1 SLAPC: 106.1*

*Performance Category: Security Event Reporting*

*Increment 1 SLAPC: 106.2*

N00024-00-D-6000

Conformed Contract P00129

*Performance Category: Security Event Response*

*Increment 1 SLAPC: 106.3*

*Performance Category: Configuration Management*

*Increment 1 SLAPC: 106.4*

**SERVICE NAME: NMCI INTRANET**

**SLA: 107**

*Performance Category: Availability*

*Increment 1 SLAPC: 107.1*

*Performance Category: Latency/Packet Loss*

*Increment 1 SLAPC: 107.2*

*Performance Category: Voice and Video Quality of Service*

*Increment 1 SLAPC: 107.3*

**B. USMC AVIATION MESSAGE**

From: ou:CMC WASHINGTON DC C4(uc) [c=US;a=DMS;o=VA12;cn=AL 11397;ou1=TVYX4;ou2=MLADCOC2;]  
Sent: Thursday, September 02, 2004 12:34 PM  
To: COMCABWEST(UC); AL 11398(UC); AL 11397(UC); COMCABEAST(UC)  
Cc: CMC WASHINGTON DC C4 CP(UC); CMC WASHINGTON DC C4(UC)  
Subject: MARINE CORPS TACTICAL AVIATION NAVY MARINE CORPS INTRANET  
/(NMCI) TRANSITION M R 021600Z SEP 04 ou:CMC WASHINGTON DC C4(uc)  
UNCLAS  
COMMARCORBASESLANT

Importance: Low

TO COMCABWEST(UC)  
AL 11398(UC)  
AL 11397(UC)  
COMCABEAST(UC)  
CC CMC WASHINGTON DC C4 CP(UC)  
CMC WASHINGTON DC C4(UC)

UNCLASSIFIED//

MSGID/GENADMIN/CMC WASHINGTON DC C4 CP//  
SUBJ/MARINE CORPS TACTICAL AVIATION NAVY MARINE CORPS INTRANET  
/(NMCI) TRANSITION MESSAGE 4//  
REF/A/MSG/CMC WASHINGTON DC C4/171924ZAUG2004//  
REF/B/MSG/CMC WASHINGTON DC C4/091400ZJUL2004//  
AMPN/REF A IS A JOINT C4/AVN ASL MESSAGE THAT PROVIDED GUIDANCE TO ASSIST GROUPS AND SQUADRONS IN ORDERING AND IMPLEMENTING AN NMCI SOLUTION AND INCLUDED MAG HEADQUARTERS, ACTIVE FLYING SQUADRONS, LOGISTICS SQUADRONS AND AVIATION MARINE CORPS CALIBRATION ACTIVITIES ONLY. REF B IS THE NMCI Q3 BASELINE SCHEDULE.//  
POC/GARANT PC/COL/HQMC AVN ASL/-/TEL:DSN 224-1835/TEL:COMM 703-614-1835/EMAIL:GARANTPC@HQMC.USMC.MIL//  
POC/GLOVER RA/CIV/PM NMCI IT1/-/TEL:DSN 278-0709 /TEL:COMM 703-784-0709/EMAIL:GLOVERRA@USMC.MIL//  
POC/HILTON PK/COL/C4 CIO/-/TEL:DSN 223-3490/TEL:COMM 703-693-3490 /EMAIL:HILTONPK@HQMC.USMC.MIL//

GENTEXT/REMARKS/1. THIS MESSAGE PROVIDES ADDITIONAL GUIDANCE FOR MARINE AIRCRAFT WING (MAW) AND MARINE CORPS AIR STATION (MCAS) UNITS THAT ARE PREPARING TO TRANSITION TO NMCI AND ARE NOT ADDRESSED IN REF A.

2. MAW AND COMCAB/MCAS UNITS THAT ARE NOT "TACTICALLY ALIGNED" AND ARE LISTED BELOW, WILL CONTINUE WITH THE NMCI SEAT ROLLOUT PLAN AS DEVELOPED JOINTLY BY THE SITE TRANSITION-OFFICER-IN-CHARGE (STOIC) AND EDS TEAM (READ IN TWO COLUMNS)

MAW	MCAS
HQ MAW	HHS
MACG	VMR
MTACS	
MASS	
MWCS	
MACS	
LAAD BN	
VMU	
MWSG	
MWSS	

3. MCSC WILL BE INFORMED ON ALL CORRESPONDENCE REGARDING EXECUTION AND VARIATIONS OF SEAT ROLLOUT. MAW G-6'S OR THEIR DESIGNATED REPRESENTATIVES WILL CONTINUE TO WORK WITH LOCAL STOIC AND CTR TO PLACE NMCI SEAT ORDERS WITHIN THE LIMITS OF CURRENTLY BUDGETED NMCI FUNDS AND EXECUTE BASELINE SCHEDULES IDENTIFIED IN REF B.

4. TO FURTHER CLARIFY REF A, ALL MARINE AIRCRAFT GROUPS WILL REMAIN IN EXTENDED AOR AND THE "AS-IS" NETWORK WILL NOT BE CHANGED UNTIL OTHERWISE DIRECTED.

5. POLICY QUESTIONS CAN BE DIRECTED TO HQMC ASL/C4.//

## C. APOC TIWG CHARTER



DEPARTMENT OF THE NAVY  
HEADQUARTERS UNITED STATES MARINE CORPS  
2 NAVY ANNEX  
WASHINGTON, DC 20380-1775

IN REPLY REFER TO:  
5000  
HQMC C4  
4 Jan 2005

SUBJ: USMC NAVY MARINE CORPS INTRANET (NMCI) DEPLOYABLES TEAM CHARTER

1. Purpose. To establish the USMC NMCI Test Integration Work Group (NMCI TIWG) and its mission.
2. Cancellation. None.
3. Background
  - a. The Marine Corps Oversight Council (MROC) has directed that efforts be made to address MAGTF NMCI deployable concerns with an emphasis on aviation requirements. Accordingly, the NMCI TIWG was formed to determine the capability of current NMCI policy and procedures to adequately support deployable MAGTF units in the following phases:
    - 1.) Transition from garrison NMCI environment.
    - 2.) Sustainment of deployed combat focused units.
    - 3.) Transition to a deployed status and reintegrate into the NMCI garrison environment.
  - b. HQMC C4 and USMC PM NMCI will serve as co-chairs of this work group and actively drive this effort. The Marine Corps Operational Test and Evaluation Activity (MCOTEA) will serve as the assessment lead to include final coordination of the planning, conduct and post-assessment reporting.
4. Mission. The NMCI TIWG will accomplish the following:
  - a. Interface with Director NMCI representatives and Navy stakeholders, to include Space And Naval Warfare Command (SPAWAR) and Commander Operational Test and Evaluation Force (COMOPTEVFOR), to support the planning, conduct and reporting of follow on test and evaluation (FOT&E) of NMCI deployables as they relate to the USMC. Every effort should be made to align USMC deployable concerns with the FOT&E process currently envisioned by the Director NMCI.
  - b. Plan, conduct and report on a "Proof of Concept" of NMCI deployables during 4th Qtr FY-05 as it specifically relates to USMC aviation requirements and concerns. Provide a report to HQMC C4 by 29 April 05 on findings, conclusions and recommendations on the capability of USMC aviation to deploy and return to garrison in an NMCI environment.

- c. Plan, conduct and report on the ability of NMCI to support the deploying needs of a MAGTF. This assessment should include command, ground, aviation, and combat service support elements and the supporting establishment. Every effort should be made to align this assessment with the timetable for the assessment of FOT&E deployables envisioned by Director NMCI to occur late FY05 or during FY06. Within 45 days of the conclusion of the FOT&E, MCOTEA will provide a quick look report to the MROC on their findings, conclusions and recommendations regarding NMCI and the MAGTF's ability to conduct requisite operations.

## 5. Organization

- a. Chair: This will be shared by USMC PM NMCI and HQMC C4
- b. Assessment lead: MCOTEA
- c. Members:
  - 1) Marine Corps Systems Command (MCSC)
  - 2) HQMC, Command, Control, Communications and Computers (C4)
  - 3) HQMC Plans, Policies and Operations (PP&O)
  - 4) HQMC Installations and Logistics (I&L)
  - 5) Marine Corps Combat Development Command (MCCDC)
  - 6) Marine Corps Network and Security Command (MCNOSC)
  - 7) Marine Corps Operational Test and Evaluation activity (MCOTEA)
  - 8) Electronic Data Systems, INC. (EDS)
- d. Ad Hoc Members: Representatives of the following organizations are encouraged to participate and will be provided access to relevant issues, discussions, and results for specific purposes. Representatives will be invited to participate when issues relevant to their organizations are addressed.
  - 1) Director NMCI
  - 2) Space and Naval Warfare Systems Command (SPAWAR) PMW-164
  - 3) Commander Operational Test Force (COTF)
  - 4) Marine Corps Tactical Systems Support Activity (MCTSSA)
  - 5) MAGTF Staff Training Program (MSTP)
  - 6) Training and Education Command (TECOM)
  - 7) Joint Interoperability Test Command (JITC)

- 6. Scope. As co-chairs, USMC PM NMCI and HQMC C4 will provide overall guidance and ensure all preparation for this effort is conducted in timely and productive process. When required, team members will assist MCOTEA's efforts as needed in assessment planning, conduct and reporting.

## 7. Responsibilities

- a. USMC PM NMCI – as TIWG co-chair and material developer, plan, coordinate and conduct all necessary efforts to ensure all activities leading to the conduct of the Proof of Concept assessment and the FOT&E are successfully completed. This includes ensuring the availability of units and assets for successful completion of assessments.
- b. HQMC C4 – as TIWG co-chair and overall advocate, plan and coordinate efforts leading to a successful assessment of NMCI. As advocate, be the final arbitrator of requirements.
- c. HQMC PP&O – act as advocate for ground forces that participate in the planned assessments.
- d. HQMC Aviation – act as advocate for aviation forces that participate in the planned assessments.
- e. HQMC I&L – act as advocate for combat service support forces and the supporting establishment that participate in the planned assessments.
- f. MCNOSC – act on behalf of the Commanding Officer of MCNOSC to ensure MCEN issues are clearly identified and resolved or mitigated.
- g. MCOTEA – act on behalf of the Director MCOTEA and be the final arbitrator in the specific planning, conduct and post assessment reporting of the planned assessments.
- h. MCCDC – act as advocate for the Command Elements that participate in the planned assessments.

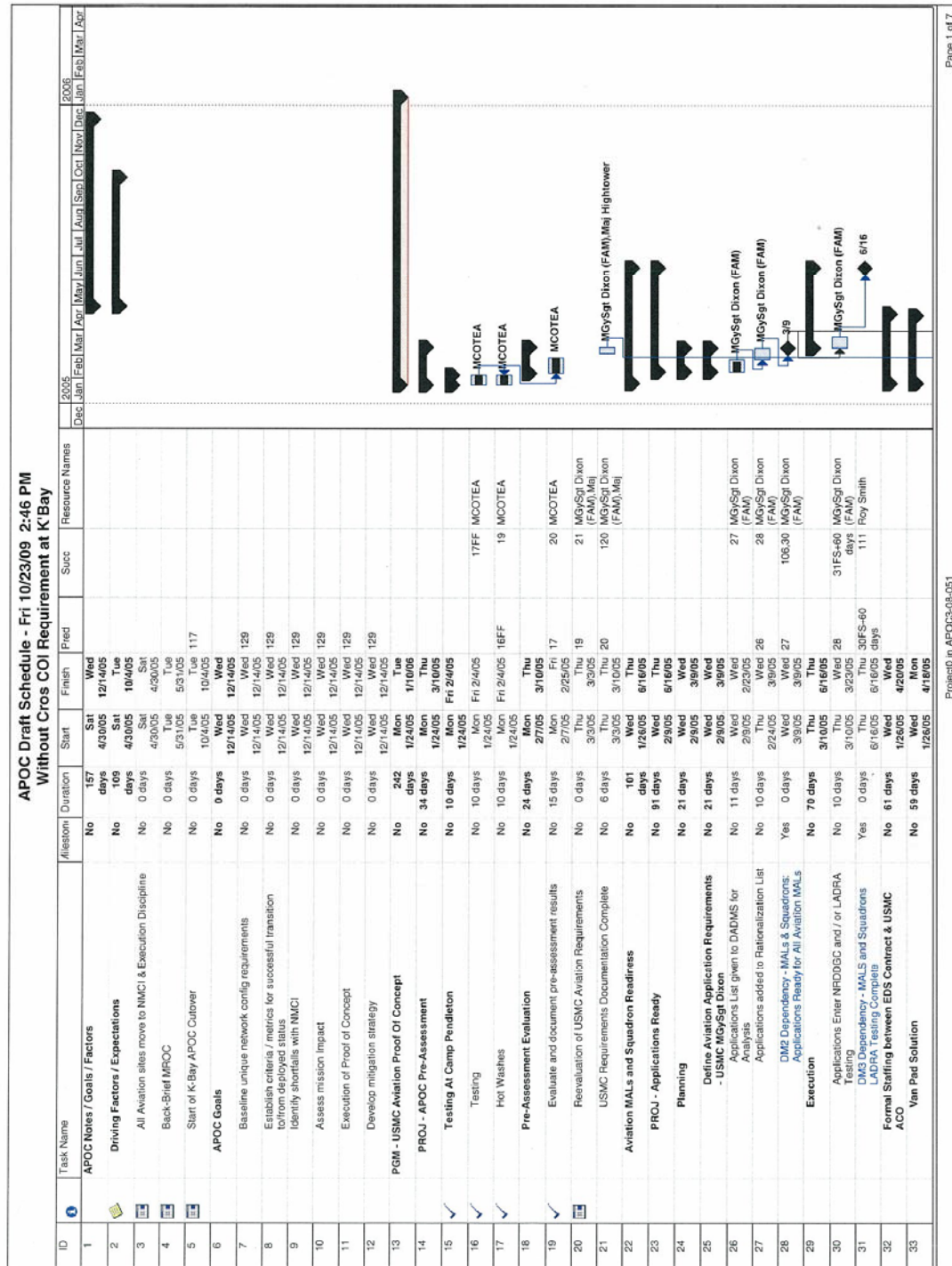
8. Effective Date. This charter is effective upon concurrence as indicated below.

<u>Dir C4</u>	<u>Date</u>	
<u>Gr</u>	<u>2 May 05</u>	Approved
_____	_____	Disapproved
_____	_____	Other: _____

<u>CG MCSC</u>	<u>Date</u>	
<u>WDC</u>	<u>14 June '05</u>	Approved
_____	_____	Disapproved
_____	_____	Other: _____

<u>DCMC AVN</u>	<u>Date</u>	
<u>M Post</u>	<u>25 Jan 05</u>	Approved
_____	_____	Disapproved
_____	_____	Other: _____

## D. APOC PROJECT SCHEDULE





**APOC Draft Schedule - Fri 10/23/09 2:46 PM  
Without Cross COI Requirement at K'Bay**

ID	Task Name	Milestone	Duration	Start	Finish	Prod	Success	Resource Names	2005	2006
34	Complete Staffing of engineering effort	No	3 days	Mon 3/7/05	Wed 3/9/05		37,35	Jason Spezzano	Dec	Jan
35	Initial Meeting to discuss Mobile Facility Issue	No	2 days	Wed 1/28/05	Thu 1/27/05	34	36	Jason Spezzano	Jan	Feb
36	Draft Solution distributed for review	No	0 days	Wed 2/2/05	Wed 2/2/05	35	37	Jason Spezzano	Jan	Feb
37	Meetings to Review of Van Pad Solution	No	7 days	Thu 3/10/05	Fri 3/18/05	34,36	39,41	Jason Spezzano	Jan	Feb
38	<b>Network Management - Con Ops</b>	No	5 days	Mon 3/21/05	Fri 3/25/05					
39	SNMP red only strings worked out	No	3 days	Mon 3/21/05	Wed 3/23/05	37	40	John Hamlette		
40	MCNOSC/QNOC hand offs	No	2 days	Thu 3/24/05	Fri 3/25/05	39	122	John Hamlette		
41	SLA / Contractual Estimates / Issues (Non-Cross COI)	No	5 days	Mon 3/21/05	Fri 3/25/05	37	42	Art Rodriguez		
42	Develop MOU / MOA	No	5 days	Mon 3/29/05	Fri 4/1/05	41,59	43FS+10 days	Melanie Springer		
43	Get signatures on MOU / MOA	No	1 day	Mon 4/18/05	Mon 4/18/05	42FS+10 days	47,50,51,44	Melanie Springer		
44	DM1 Dependency - All MALS Design Mods Approved - Site Survey, CLIN ordering, Logical Network Typology. Designs can occur	Yes	0 days	Mon 4/18/05	Mon 4/18/05	43	101,53			
45	<b>Communications</b>	No	2 days	Tue 4/19/05	Wed 4/20/05					
46	<b>Site Transition Manager's NetMeeting Training Call</b>	No	2 days	Tue 4/19/05	Wed 4/20/05					
47	Review docs and process and provide answers to any clarifications	No	1 day	Tue 4/19/05	Tue 4/19/05	43	48	Jason Spezzano		
48	Put NetMeeting Notes into a web site for later references	No	1 day	Wed 4/20/05	Wed 4/20/05	47		Jason Spezzano		
49	<b>CTR NetMeeting Training Call</b>	No	1 day	Tue 4/19/05	Tue 4/19/05					
50	Review docs and process and provide answers to any clarifications	No	1 day	Tue 4/19/05	Tue 4/19/05	43		Maj Hightower		
51	Government Communication to the STOCs	No	1 day	Tue 4/19/05	Tue 4/19/05			MGySgt Dixon (FAM), LtCol Costa (HOMC C4), Lt Cruz (US		
52	<b>Issue Resolutions from Pre-Assessment</b>	No	5 days	Tue 4/19/05	Mon 4/25/05					
53	DM2 Dependency Resolve CLIN027AG Issues	Yes	5 days	Tue 4/19/05	Mon 4/25/05	44	74	NET CER		
54	<b>Aviation MALS &amp; Squadrons with Cross COI Issues</b>	No	144 days	Wed 1/28/05	Wed 8/17/05					
55	<b>PROJ - Infrastructure / Cross COI Ready (Including B1)</b>	No	144 days	Wed 1/28/05	Wed 8/17/05					
56	<b>Cross COI Discussion / High Level Engineering Decision</b>	No	57 days	Wed 1/28/05	Thu 4/14/05					
57	Input from HQMC C4, CMA	No	3 days	Wed 1/28/05	Fri 1/28/05		58	Rich Meehan, Maj Hightower		
58	DM1 CC Dependency - EDS Leadership decisions on Cross COI hardware & new	Yes	5 days	Fri 2/25/05	Thu 3/3/05	57	59,94	Jason Spezzano, Rich		
59	Meet with USMC C&A for review of solution	No	1 day	Fri 3/11/05	Fri 3/11/05	58	79,85,42,60			
60	SLA / Contractual Estimates / Issues (Cross COI)	No	5 days	Mon 3/14/05	Fri 3/18/05	59	61	Art Rodriguez		
61	Develop MOU / MOA	No	5 days	Mon 3/21/05	Mon 3/21/05	60	62FS+10 days	Melanie Springer		
62	Get signatures on MOU / MOA	No	1 day	Mon 4/11/05	Mon 4/11/05	62	63	Melanie Springer		
63	DM1 CC Dependency - MALS Design Mods Approved - Site Survey, CLIN ordering, Logical Network Typology. Designs can occur	Yes	0 days	Mon 4/11/05	Mon 4/11/05		64			
64	Request for ECPV Projects (may not be needed for Alcatel solution used)	No	3 days	Tue 4/12/05	Thu 4/14/05	63	79	Rich Meehan		
65	Get SPAWAR / Navy Point of Contact for APOC Cross COI Coordination	Yes	0 days	Thu 3/10/05	Thu 3/10/05		68	LtCol Costa (HOMC C4)		

Project in APOC3-08-051

**APOC Draft Schedule - Fri 10/23/09 2:46 PM**  
**Without Cros COI Requirement at K'Bay**

ID	Task Name	Allocation	Duration	Start	Finish	Pred	Succ	Resource Names	2005	2006
66	<b>Execution</b>	No	113 days	3/10/05	Wed 8/17/05				Dec	Jan
67	<b>Navy Move NALCOMIS behind B1</b>	No	113 days	3/10/05	Wed 8/17/05				Feb	Mar
68	DM1 CC Dependency - SPAWAR develops plan to move NALCOMIS	Yes	4 days	3/10/05	Thu 3/15/05	65	68,70		Apr	May
69	SPAWAR Communicates plan to effected Navy / Marine sites	No	1 day	3/16/05	Wed 3/16/05	68			Jun	Jul
70	SPAWAR determines why NALCOMIS servers are currently behind B2	No	5 days	3/16/05	Wed 3/23/05	68			Aug	Sep
71	SPAWAR determines if anything breaks by moving their NALCOMIS servers into	No	3 days	3/23/05	Fri 3/25/05	70			Oct	Nov
72	SPAWAR modify configuration of NALCOMIS servers to meet security	No	5 days	3/28/05	Fri 4/1/05	71			Dec	Jan
73	SPAWAR submit to Navy DAA for approval to move NALCOMIS into NMCI	No	10 days	4/4/05	Fri 4/15/05	72			Feb	Mar
74	Sites affected order CLIN27 as needed to connect servers within NMCI	No	0 days	4/25/05	Mon 4/25/05	73,53			Apr	May
75	Move Navy servers into NMCI inside B1 (4 month est)	No	80 days	4/26/05	Wed 8/17/05	74			Jun	Jul
76	DM3 CC Dependency - Navy NALCOMIS moved	Yes	0 days	8/17/05	Wed 8/17/05	75			Aug	Sep
77	<b>Cross COI / B1</b>	No	105 days	3/11/05	Fri 8/9/05				Oct	Nov
78	<b>Install Cross COI in San Diego</b>	No	45 days	4/15/05	Fri 6/17/05				Dec	Jan
79	Project required for implementation (4 - 6 week est)	No	30 days	4/15/05	Fri 5/26/05	64,59			Feb	Mar
80	DM1 CC Dependency - Analysis, Approval of SD Cross COI B1 and	Yes	0 days	5/26/05	Thu 5/26/05	79			Apr	May
81	<b>West Coast Sites Cross COI Connectivity</b>	No	20 days	5/20/05	Fri 6/17/05				Jun	Jul
82	Request as needed (3 - 4 weeks if babysat)	No	20 days	5/20/05	Fri 6/17/05	79FS-5 days			Aug	Sep
83	Specific IP addresses are needed to submit the CCR to MCNOSC (DM3 dependency?)	No	5 days	5/20/05	Thu 5/26/05	79FS-5 days			Oct	Nov
84	<b>Build USMC B1 in Pearl Harbor</b>	No	85 days	3/11/05	Fri 7/12/05				Dec	Jan
85	DM1 CC Dependency - Analysis, Approval of HI B1 and funding	Yes	0 days	3/11/05	Fri 3/11/05	59			Feb	Mar
86	Input project to build the B1	No	5 days	3/14/05	Fri 3/18/05	85			Apr	May
87	<b>Build the unclassified B1 (est 3-4 months)</b>	No	80 days	3/21/05	Mon 7/12/05				Jun	Jul
88	Order / Delivery of Equipment	No	20 days	3/21/05	Mon 4/18/05	86			Aug	Sep
89	Installation / Testing	No	15 days	4/18/05	Fri 5/6/05	88			Oct	Nov
90	NOC Acceptance	No	15 days	5/9/05	Fri 5/27/05	89			Dec	Jan
91	Government Review	No	15 days	5/31/05	Mon 6/20/05	90			Feb	Mar
92	IATO Granted	No	15 days	6/21/05	Tue 7/12/05	91			Apr	May
93	<b>Install Cross COI VPN in Hawaii</b>	No	100 days	3/16/05	Fri 8/9/05				Jun	Jul
94	Input project to build B1 Pearl Harbor	No	0 days	3/16/05	Fri 3/16/05	86,58			Aug	Sep
95	Implementation Project (in conjunction with B1 build)	No	10 days	7/13/05	Tue 7/26/05	92,94			Oct	Nov
96	<b>Hawaii Sites Cross COI Connectivity</b>	No	20 days	7/13/05	Wed 8/9/05				Dec	Jan
97	Request as needed (3 - 4 weeks if babysat)	No	20 days	7/13/05	Wed 8/9/05	95FS-10 days			Feb	Mar



APOC Draft Schedule - Fri 10/23/09 2:46 PM Without Cros COI Requirement at K'Bay										2005												2006													
ID	Task Name	Allston	Duration	Start	Finish	Pred	Succ	Resource Names		Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr									
98		No	5 days	Wed 7/27/05	Tue 8/2/05	95		99 EDS, Government																											
99		Yes	0 days	Tue 8/9/05	Tue 8/9/05	97,98																													
100	PROJ - APOC Site Ready Kaneohe HI - not waiting for Cross COI	Yes	118 days	Tue 4/19/05	Tue 10/4/05																														
101	DM1 for MALS and Squadrons (Need NALCOMIS and Van Paid decisions made)	Yes	1 day	Tue 4/19/05	Tue 4/19/05	44		102FS+5 days	Robert Coater																										
102	DM1 Remaining tasks complete	Yes	0 days	Tue 4/26/05	Tue 4/26/05	103		103	Robert Coater																										
103	Certification & Accreditation documentation from PMO	Yes	1 day	Wed 4/27/05	Wed 4/27/05	102		104	Robert Coater																										
104	Classified Transport Boundary room certified	Yes	4 days	Thu 4/28/05	Tue 5/3/05	103		105	Robert Coater																										
105	IATB obtained	Yes	20 days	Wed 5/4/05	Wed 6/1/05	104		106	Robert Coater																										
106	DM2 Preliminary meeting (without Cross COI)	Yes	1 day	Thu 6/2/05	Thu 6/2/05	105		107	Robert Coater																										
107	DM2	Yes	1 day	Fri 6/3/05	Fri 6/3/05	106		110,111,112	Robert Coater																										
108	Execution	No	85 days	Mon 6/6/05	Tue 10/4/05																														
109	IATO	No	1 day	Mon 6/6/05	Mon 6/6/05	107		113	Robert Coater																										
110	BIO	No	33 days	Mon 6/6/05	Thu 7/2/05	107		113	Robert Coater																										
111	LADRA Complete	No	0 days	Thu 6/16/05	Thu 6/16/05	107,31		113	Robert Coater																										
112	Legacy Apps Q-Plan Complete	No	33 days	Mon 6/6/05	Thu 7/2/05	107		113	Robert Coater																										
113	DM3 Preliminary Meeting	Yes	1 day	Fri 7/22/05	Fri 7/22/05	108,110,11		114	Robert Coater																										
114	DM3	Yes	1 day	Thu 8/18/05	Thu 8/18/05	113,76		15,117SF+33 ys,118SF+33	Robert Coater																										
115	OCM Begin Processing	No	9 days	Fri 8/19/05	Wed 8/3/05	114		121,116	Robert Coater																										
116	Seats shipped	No	10 days	Thu 9/1/05	Thu 9/1/05	115		117	Robert Coater																										
117	Baseline Cutover Start	No	0 days	Tue 10/4/05	Tue 10/4/05	115		5,118	Robert Coater																										
118	Current Cutover Start	Yes	0 days	Tue 10/4/05	Tue 10/4/05	127,128,129		127,128,129	Robert Coater																										
119	PROJ - Proof of Concept Testing	No	193 days	Fri 3/11/05	Wed 12/14/05																														
120	Create APOC Test Plan	No	30 days	Fri 3/11/05	Thu 4/2/05	21		121	Maj Hightower, Al Cruz (USMC PMO), Bill Noble																										
121	CLIN 0004AC and all processes associated with using the Seats via the NMCI environment into the Marine Air Logistics Squadron (MALS) Infrastructure	No	20 days	Thu 9/1/05	Thu 9/29/05	115,120		122,124,123	Maj Hightower, Test Director																										
122	Test SNMP visibility of the switch	No	1 day	Fri 9/30/05	Fri 9/30/05	121,40		127,123																											
123	Test Cross COI, B, general infrastructure	No	5 days	Mon 10/3/05	Fri 10/7/05	122,121		124																											
124	Start APOC Testing	Yes	0 days	Fri 10/7/05	Fri 10/7/05	121,123		125	MCOTEA																										
125	Removing seats from NMCI environment, and into the MALS Tactical Deployed Environment and returning	No	15 days	Mon 10/10/05	Fri 10/28/05	118,124		127	MCOTEA																										
126	Assessment will address functionality of various tactical applications used by deploying units.	No	15 days	Mon 10/31/05	Mon 11/21/05	118,122,11		128	MCOTEA																										
127	Data reach back, email redirection, data migration, and other associated capabilities.	No	15 days	Mon 10/31/05	Mon 11/21/05	118		129	MCOTEA																										
128	Although not inherently part of a NMCI deployable seat, interoperability between the TDN environment and	No	15 days	Wed 10/25/05	Wed 10/25/05	118,127,11		10,11,12,130	MCOTEA																										
129	Applications and data migrated from the deployed TDN environment to NMCI must remain accessible by	No	15 days	Tue 11/22/05	Tue 11/22/05	129		132																											
130	End APOC Testing	Yes	0 days	Wed 12/14/05	Wed 12/14/05	129																													

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Project0 in APOC3-06-051

APOC Draft Schedule - Fri 10/23/09 2:46 PM Without Cros COI Requirement at K'Bay																								
ID	Task Name	Milestone	Duration	Start	Finish	Pred	Succ	Resource Names	<div>2005<div>Dec</div>JanFebMarAprMayJunJulAugSepOctNovDec</div> <div>2006<div>Jan</div>FebMarApr</div> <div>12/15</div>															
131	APOC Closedown	No	15 days	Thu 12/15/05	Tue 1/10/06																			
132	Evaluate and document assessment results	Yes	15 days	Thu 12/15/05	Tue 1/10/06	Tue 130 1/10/06	133	MCOTEA																
133	CD - CLOSEDOWN COMPLETE	No	0 days	Tue 1/10/06	Tue 1/10/06	Tue 132 1/10/06		Maj Hightower, Test Director, Test Team																
												Project0 in APOC3-08-051												
												Page 5 of 7												

# **APOC Draft Schedule - Fri 10/23/09 2:46 PM** **Without Cros COI Requirement at K'Bay**

2	<p><b>Driving Factors / Expectations</b></p> <p>Problem: Perceived shortfalls in NMCI capability to support the operational requirements of Marine Air Groups</p> <ul style="list-style-type: none"> <li>17 August MROC Decision to proceed with a Two Phase Proof of Concept</li> <li>Working Group established to evaluate plan (20 Aug)</li> <li>PM-NMCI/MCOTEA/CA/AVN/EDS</li> <li>Developed pre-assessment approach in mid-Sep.</li> <li>Jan Pre-Assessment <ul style="list-style-type: none"> <li>Feb 05 Quick Look Report (Feb 22 Report Review Stafford)</li> <li>April 05 all Avation sites move to NMCI &amp; Execution Discipline.</li> <li>Back-Brief MROC May 05.</li> <li>July 05 Start of Cutover K'Bay APOC Site.</li> <li>FY-05 NMCI fiscal obligations include affected seats.</li> <li>USMC Aviation will be involved in Dir NMCI FOT&amp;E mid-05.</li> </ul> </li> <li>Aviation desired to complete Pre-Assessment before commencing seat cutovers.</li> <li>Pre-Assessment to validate and refine operational procedures for Aviation community ensuring NMCI meets operational needs.</li> </ul> <p>Total Unfunded costs: \$15.4M (OWMC)</p>
40	<p><b>MCNOSC/MROC hand offs</b></p>
58	<p><b>DM1 CC Dependency - EDS Leadership decisions on Cros COI hardware &amp; new business (Van Pads)</b></p>
64	<p><b>Request for ECPV Projects (may not be needed is Alcatel solution used)</b></p>
75	<p><b>Move Navy servers into NMCI inside B1 (4 month est)</b></p>
78	<p><b>Install Cros COI in San Diego</b></p>
79	<p><b>Project required for implementation (4 - 6 week est)</b></p>
82	<p><b>Request as needed (3 - 4 weeks if babysat)</b></p>
86	<p><b>Input project to build the B1</b></p>
94	<p><b>Input project to build B1 Pearl Harbor</b></p>
97	<p><b>Request as needed (3 - 4 weeks if babysat)</b></p>
101	<p><b>DM1 for RALS and Squadrons (Need NALCOMIS and Van Pads decisions made)</b></p>
102	<p><b>DM1 Remaining tasks complete</b></p>
	<p>Per 12/18 Cooter email:</p>
	<p>Status of Action Items now:</p>
	<p>1. Now that we are in AOR and some shaky infrastructure instances documented in the SCM it is signed by SM and STOIC.</p>
	<p>2. High Level Design...This is a tuffy primarily because when you ask around you get a different definition of exactly what is a 'high level design'. In the end we settled on creating a bubble chart which shows the locations of the buildings, WICS, basically how the network will radiate from the main distro switches. We followed what was created for the base (pre MAG and pre ED) which was a bubble chart. The precise architecture of the network; we</p>

<p><b>APOC Draft Schedule - Fri 10/23/09 2:46 PM</b>  <b>Without Cros COI Requirement at K'Bay</b></p>	
<p>took to be done in the Detailed Design phase which according to Execution Discipline is accomplished in the period between DM1 and DM2 and decided on at the DM2.</p> <p>3. Received the List of Apps several days after the DM1 meeting.</p> <p>In moving forward we (WAG 24.56 and my team) have considered creating a sub site for Vans and NALCOMIS users, allowing us to move forward with the remainder. The details of how this would work have yet to be put on paper.</p> <p>107 <b>DM2</b>  DM 2 Locks: CLIN Wall Plug Locations, Rationalize List Of Apps, Complete: CLINS 1-4 and CLIN 23 Numbers and Locations, Site Deployment Plan Locks, PDS Design Complete</p> <p>114 <b>DM3</b>  DM 3 Locks: OCM Data submitted, Application to Seat to Wall Plug data, Seat Deployment Schedule</p>	
<p>Project0 in APOC3-08-051</p>	
<p>Page 7 of 7</p>	

## E. USMC AVIATION APPLICATIONS TEMPLATE

	Application Long Name	Application Acronym	Version	DADMS ID	Navy RFS Number	USMC RFS Number
1	Airborne Weapons Information System	AWIS-AWARS	Web	454	None	None
2	Aircraft Engine Management System	AEMS	Web	14931	Several	None
3	Aircraft Inventory Readiness and Reporting System	AIRRS	Web	22795	62116	62116
4	AIRRS-NALCOMIS OOMA SCIR		Web	31093	None	None
5	Automated Weight & Balance System	AWBS	9.0	8228	85825	85825
6	AV-8B Hover Performance Program		1.2B	29179	68145	68145
7	Aviation Maintenance and Supply Readiness Report		3.0	22639	72791-CDA	None
8	Aviation Maintenance Training Continuum System (AMTCS) Software Module (ASM)	ASM	2.0	17386	82335	82335
9	Aviation Material Maintenance Management	AV3M	004-14.00.00	15658	62079	62079
10	Aviation StoreKeeper Information Tracking System	ASKIT	7.1.1	31896	88054	85966-CDA
11	Broadened Arrangement of Resources from a Basic Accessory Relocation Application - Supply Issue and Recovery System 2000	BARBARA SIRS	1.3.136	30501	81376	81376
12	Central Technical Publications Library	CTPL	3.01a	29180		None
13	Electronic Maintenance System	EMS2 Viewer	2.8.1.0	34332	88935	88935
14	Individual Component Repairables List	ICRL	WEB	7416	Several	None
15	Joint Air Logistics Information System	JALIS	2.0	15540	10418	10418
16	Joint Aviation Technical Data Integration	JATDI. REDSTONE.A RMY.MIL	WEB	15768	62082	62082

	<b>Application Long Name</b>	<b>Application Acronym</b>	<b>Version</b>	<b>DADMS ID</b>	<b>Navy RFS Number</b>	<b>USMC RFS Number</b>
17	Local Asset Management System	LAMS	4.0	21767	68127	68127
18	Main Rotor Blade Track and Balance		2.1	27405		
19	MEASURE Automated Information System - Personal Computer	MEASURE AISPC	4.3	20734	77885	77885
20	MEASURE PC INVENTORY QUERY	MEASURE INVENTORY QUERY	W9808.3 1	10073	85047	85047
21	METPRO	METPRO	2.1	22776	78876	78876
22	Module Test & Repair Suite	MTR Suite	3.5			
23	NALCOMIS (LEGACY) ORGANIZATIONAL MAINTENANCE ACTIVITY	NALCOMIS LEG OMA	122-03.05.18	21253	10624	10624
24	NALCOMIS component Sybase Open Client		11.1.1	27523	89692	89692
25	NALCOMIS Optimized Organizational Maintenance Activity	NALCOMIS OOMA	825-03.04.10 (7)	22727	87778	87778
26	NAVAL AVIATION LOGISTICS DATA ANALYSIS		Web	441		
27	NAVAL AVIATION MAINTENANCE DISCREPANCY REPORTING PROGRAM		Web	22606		
28	NAVAL TACTICAL COMMAND SUPPORT SYSTEM II DESKTOP	NTCSS II DESKTOP	803-02.02.05	23216	89691	89691
29	Navy Portable Flight Planning System	N-PFPS	3.2	14740	10699	10699
30	NTCSS INTEGRATED BARCODE SYSTEM	NTCSS IBS	894-02.00.30	22755	10759	10759
31	NTCSS NALCOMIS OPTIMIZED INTERMEDIATE MAINTENANCE ACTIVITY	NTCSS NALCOMIS OIMA	815-01.06.00	23910	87779	87779
32	NTCSS Relational Supply I	NTCSS RSUPPLY I	822-01.01.65	23909	87777	87777



	<b>Application Long Name</b>	<b>Application Acronym</b>	<b>Version</b>	<b>DADMS ID</b>	<b>Navy RFS Number</b>	<b>USMC RFS Number</b>
33	OPNAV AVIATION TRAINING MANAGEMENT SYSTEM	OATMS	8.0	17156	10423	10423
34	RETAIL ORDNANCE LOGISTICS MANAGEMENT SYSTEM	ROLMS	9.0	24475	84574	84574
35	SQUADRON ASSISTANCE/RISK ASSESSMENT	SARA	5.0.3	33304	90815	93847
36	SUPPORT EQUIPMENT CONTROLLING AUTHORITIES TOOLS		4.1	21785		
37	SUPPORT EQUIPMENT RESOURCE MANAGEMENT INFORMATION SYSTEM / SUPPORT EQUIPMENT MANAGEMENT SYSTEM		5	21995		
38	SURVIVAL EQUIPMENT ASSET TRACKING SYSTEM/INCREASED CAPABILITIES PROGRAM	SEATS/ICAPS	4.0	22942	10282	10282
39	T-AVB AUTOMATED LOAD PLANNING SYSTEM	TALPS	2.8	27597	68370	68370
40	Technical Publications Library Program	TPL	3.0	15839	77657	77657
41	VIB REVIEW	VIB REVIEW	2.2	23068	84446	84446
42	Windows Standard Automated Logistics Tool Set	WINSALTS	5.02	8231	10503	10503

## F. EDS/USMC MARINE AIR GROUPS

### Change History

The following Change History Log contains a record of changes made to this document.

Date Published/ Revised	Version No.	Author	Section/Description of Change
03-Feb-2005	1.0	Springer	DRAFT document sent to Jason Spezzano for review and input.
07-Feb-2005	1.1	Jason Spezzano	Filled in Template format with DRAFT agreement to begin staffing/routing process.
30-Oct-2007	2.0	MGySgt Connie Wright	Removed ambiguous statements and inserted NTCSS printer solution.

The document version number identifies whether the document is a working copy, final, revision, or update, defined as follows:

☐ **Final:** The first definitive edition of the document. The final is always identified as Version 1.0.

☐ **Revision:** An edition with minor changes from the previous edition, defined as changes affecting less than one-third of the pages in the document. The version numbers for revisions 1.1 through 1.9, 2.1 through 2.9, and so forth. After nine revisions, any other changes to the document are considered an update.

☐ **Update:** An edition with major changes from the previous edition,

defined as changes affecting more than one-third of the pages in the document. The version number for an update is always a whole number (Version 2.0, 3.0, 4.0, etc.).

#### **Ref (a): Revised Joint Survey Checklist**

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Ref (a) Joint Survey  
Checklist

#### **Ref (b): MAG Connectivity Template**

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"Ref (b) MAG v1-1  
2002 Format.vsd"

#### **Ref (c): 4th MAW Aviation map**

---



Ref (c): 4th MAW  
Aviation Map

#### **Ref (d): USMC NALCOMIS Printer Agreement**

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Ref (d): USMC  
NALCOMIS Printer

**RELEVANT CONTRACT PROVISIONS:**    *(Being reviewed for any applicability)*

[Insert relevant contract provisions] – Action (if required):  
Melanie Springer EDS contracts.

[Write analysis] – Action (if required): Melanie Springer EDS

## USMC DP-17 VAN PAD AGREEMENT

Contracts

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**FACTUAL BACKGROUND:** *(Will be applied to final format for historical perspective)*

---

### **AGREEMENTS / POSITION REGARDING [Describe]:**

**SCOPE: THE INFORMATION BELOW APPLIES TO USMC AVIATION MOBILE FACILITIES.**

All of these agreements have been agreed to formally and resolve deployability and applications concerns with respect to MAG units (specifically Squadrons and MALs).

The Joint Site Survey Checklist and the Connectivity Template are tools to assist sites in following the Execution Discipline Process Pre-DM 1 requirements.

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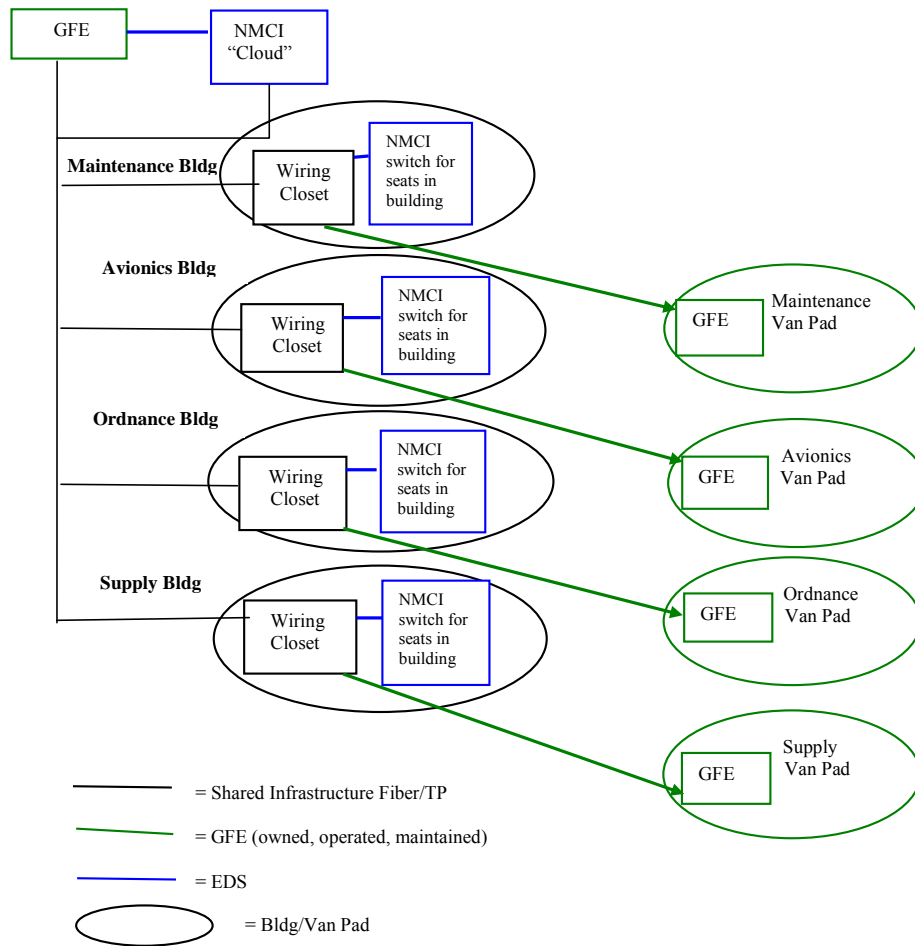
#### **Layer 1 - Physical Layer (IMA) - (See IMA Diagram)**

- Government will provide single physical MAG Point of Presence (PoP) or connectivity to MAG mobile facilities.
- NMCI will provide single physical MAG Service Point (distribution or access switch).
- Shared Infrastructure from the MAG Point of Presence (PoP) to the wiring closet (IDF, MDF).
- Wiring Closet to the Van Pad is GFE/Government OOM (owned, operated, and maintained).
- All cable in the Mobile Facilities is GFE/Government OOM (owned, operated, and maintained).

- Connection from MAG Pop to wiring closet will be at least two pair of fiber as required.
  - (1) Lit, (1) Dark to be used for fail over.

### IMA Diagram

(Shared infrastructure at times down to the VAN PAD – Survey dependent).



### Layer 2 – Network Layer (IMA)

- The following logical networks will be provided.
  - NMCI printer (1) VLAN
  - NMCI Seat (1 or more) VLANs.
  - MAG Servers & Printers VLAN.
- Marine Aviation will provide additional ports as required to accommodate NMCI seats in vans.

### **Layer 3 – Routing Layer**

- Use existing USMC Base IPs.
- When USMC deploys they will use deployed IP space.
- If VANs move to another NMCI location, NMCI will provide IP space from Base IP allocation.

### **Cross COI Communications**

- Server-to-Server communication can work through VPNs.
- Must be coordinated on a site-by-site basis.
- Will require service DAAs to be in concurrence.
- EDS needs to configure regional cross-COI VPN (today only one is between Quantico and Norfolk).
  - San Diego (SDNI) to San Diego (SDNZ).
  - K'Bay (KBAZ) over legacy B1 to Pearl (PHRL).
- Navy NALCOMIS needs to come from behind B2 and move into Navy NMCI.
- (O'CONUS) Requirement for VPN?
- 

### **BASE OPERATIONS**

- Base operations personnel will pick-up NMCI owned printers prior to units deploying.

### **ASSUMPTIONS**

Connectivity Template encompasses IMA and OMA. You will see these inserted into the connectivity template

- Network Management
  - Government will configure, manage, and monitor GFE that is part of the MAG.
  - Government will provide EDS SNMP read only community strings for monitoring.
- VPN
  - Continue to use legacy VPNs for existing tunnels, until MCNOSC agrees to shut down of legacy B-1's.
  - Shut down of legacy B-1's will transfer VPN's tunnels to NMCI B-1's.

- SLAs

*(Specific SLAs are being outlined by EDS SLA team.)*

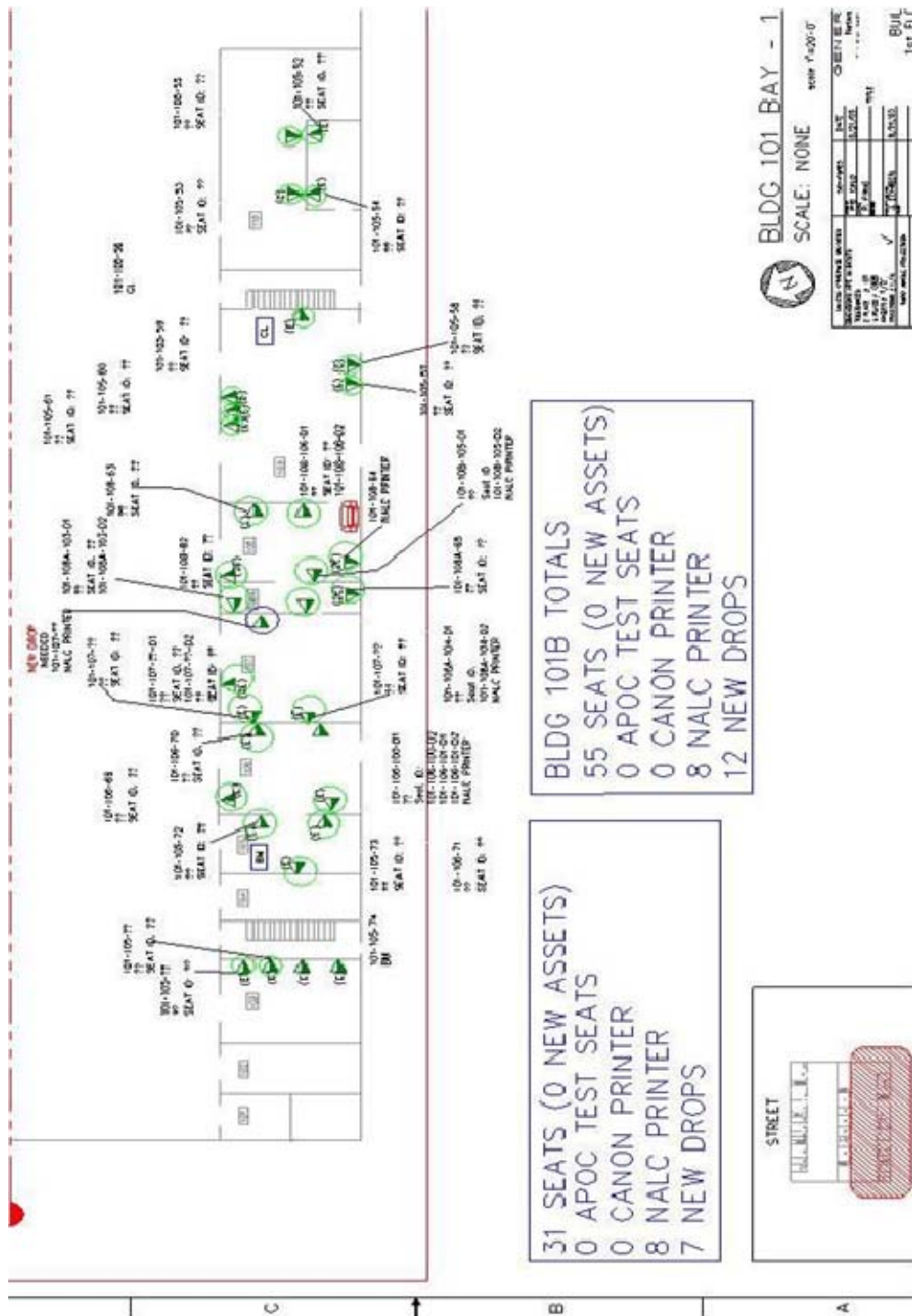
- GFE is outside scope of NMCI SLAs, but Workstation Break-fix SLAs apply.
- Any SLA that relies on Government owned infrastructure does not apply (availability, performance).
- IAVA Compliance in accordance with CLIN 0027

AG:

- USMC responsible for MAG network components (Program of Record).
- EDS responsible for NMCI Seats and Printers.

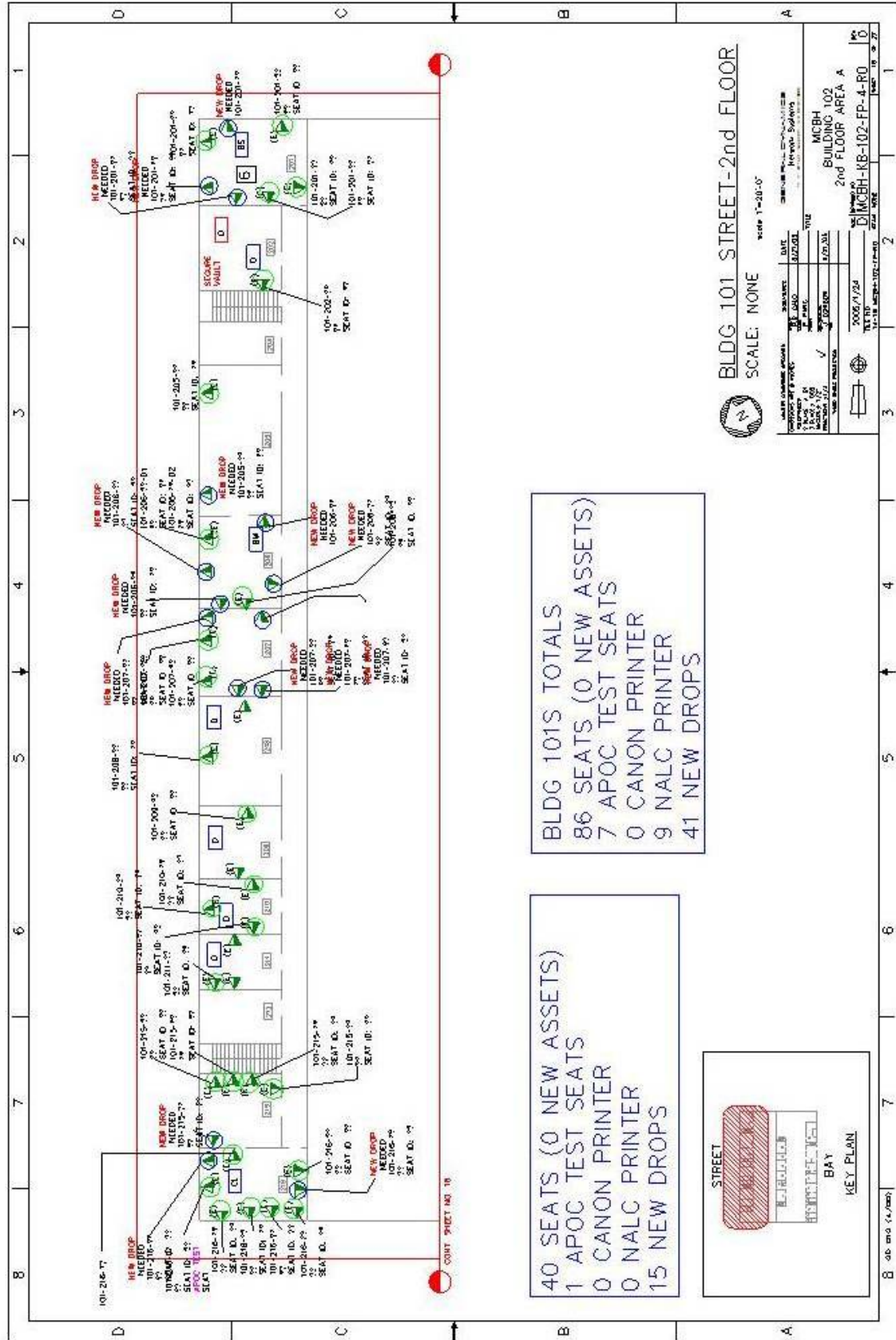
**Item of Note:** USMC Server and EDS Client IAVA updates require close coordination prior to Radia pushes. (I.E. NALCOMIS, Rsupply, Mid-Tier, JTDI, NFSA, and OOMA Updates).

## G. MCAF KANEOHE BAY NMCI TRANSITION SCHEMATICS







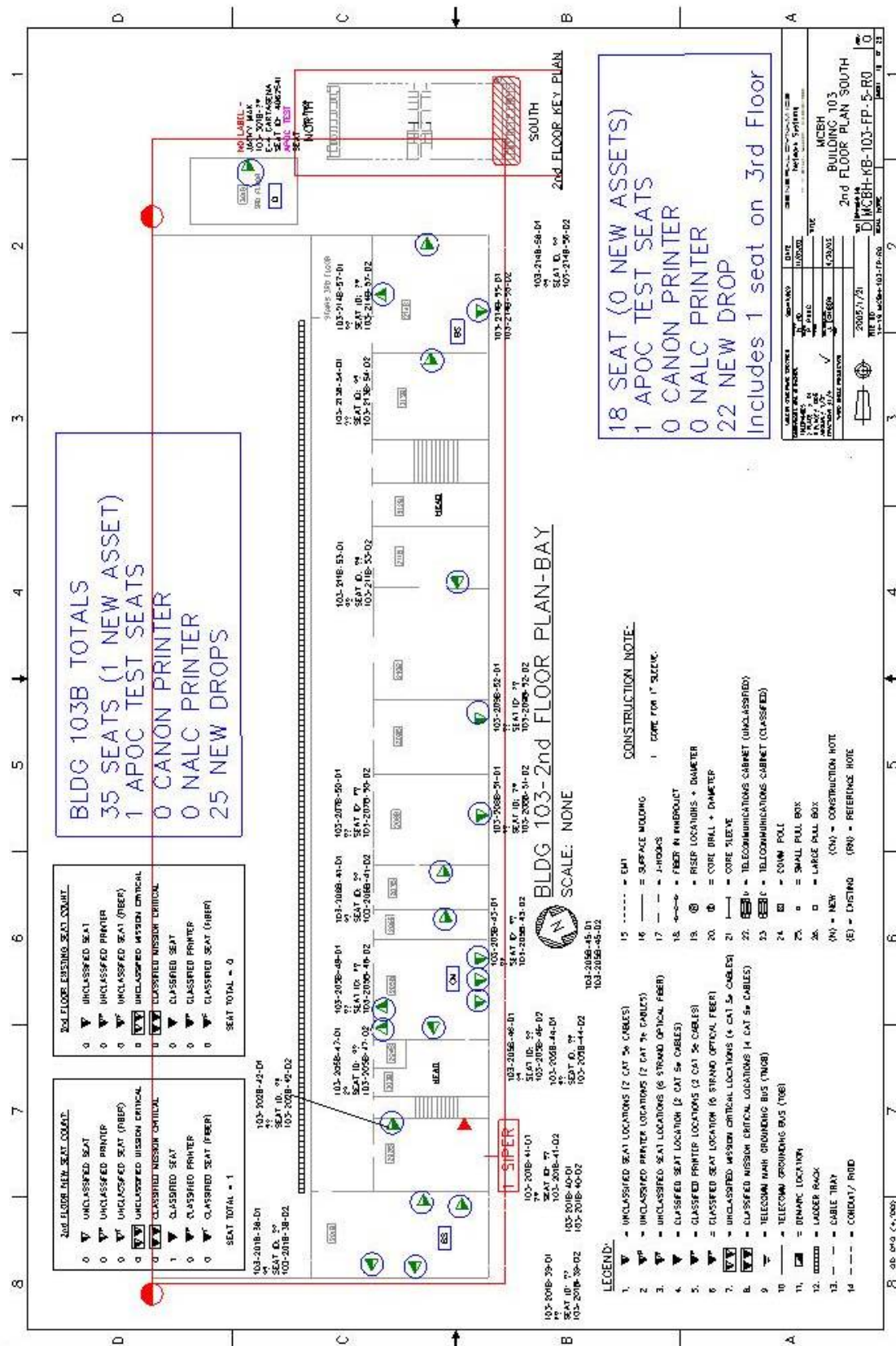


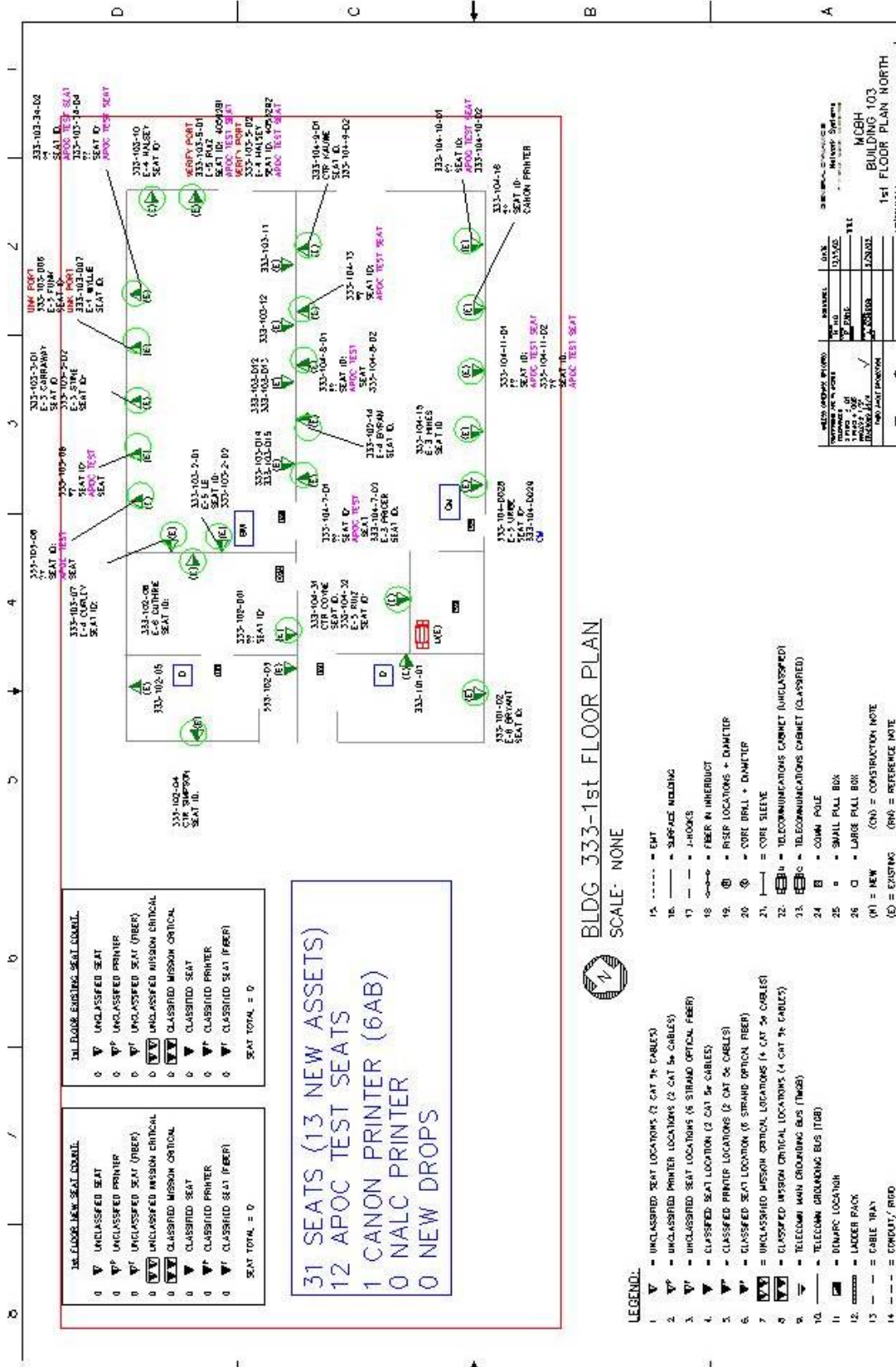






















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